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# AIR POWER: KEY TO SURVIVAL

BY

ALEXANDER P. DE SEVERSKY

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TO MY WIFE EVELYN

a pilot in her own right, this book is affectionately dedicated. Her devotion, courage, and sacrifices have always been a source of inspiration and encouragement to me.



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### *Special Note to the Reader:*

Major Seversky's text does not begin until after the twelve pages following. The publishers feel that in a book as controversial as this the reader is entitled to know the reason for its publication, and the qualifications of the author for writing it.

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## PUBLISHER'S FOREWORD

*Before you have read the first half-dozen pages of this book, you will find Major de Seversky advocating a bold doctrine: that the key to our national security and long-term peace is predominant and overwhelming air power. We (the publishers) believe that this new volume, like its predecessor, VICTORY THROUGH AIR POWER, will be both vigorously attacked and highly praised. Those who disagree with the author will wonder how a patriotic American in his right mind can advocate so dangerous a course as committing our country to the development of overwhelming air power at the expense of land and sea forces. Such critics may well ask, "What if we proceed on this course and then at a critical point in history find that these ideas are disastrously WRONG?" Those who agree with the author will, with equal cogency, ask: "What if we do not adopt de Seversky's ideas and then at a critical point in history find he was RIGHT?"*

*Early in 1942, when the writer of this Foreword read the manuscript of Major de Seversky's previous book, it seemed—like the present volume—revolutionary. We were then at war. Japanese planes had just sunk the British battleships PRINCE OF WALES and REPULSE. Bataan was besieged and in the process of surrender. The progress of the war was discouraging, the outlook seemed disastrous. The manuscript of VICTORY THROUGH AIR POWER (written before Japanese airplanes had demolished our fleet at Pearl Harbor) seemed a ray of hope in a dark world. If only we had time to build the kind of air*

power advocated in that book! If only enough Americans, in places high and low, could see the wisdom of following such a course!

It turned out then that we did have the time. Hostile planes had made a sneak attack on Pearl Harbor, but neither the planes nor the aircraft carriers were able to reach the Western shores of our country. Nor could German planes reach our Eastern shores. We were given time to improvise and experiment. During this breathing space, we built an air force that eventually played a decisive role in achieving victory. Yet it was only part of a triphibious team and never a strategic force in itself.

That was back in 1942. Since then air power has made great forward strides. The long-range B-29 superseded the B-17 and B-24. Today the B-36 has superseded the B-29. Greater planes with more fighting power and longer range are on the way, and it seems reasonable to suppose that profound changes in military thinking are in order.

Between the time of the B-17 and the B-36, the first atomic bombs were dropped over Japan. These bombs have profoundly affected the thinking of all men and women. Though the atomic bomb is by far the greatest means of devastation ever designed by man, Major de Seversky points out that it does not involve a new STRATEGY in warfare; it is instead simply a new weapon, albeit a superpowerful one, which must first be delivered against an enemy, just as an "old-fashioned" TNT bomb must be delivered—and air force remains the only truly effective means of delivery.

We believe that Major de Seversky's views deserve serious attention. As publishers, we have had on other occasions not only the responsibility but the privilege of presenting important books written by men whose opinion the public is entitled to hear. As laymen we were interested in reading the manuscript of *ONE WORLD* by Wendell Willkie. We published it, though matters of world government were very unfamiliar ground to us. We were similarly unfamiliar with matters of advanced science and engineering when we published *MODERN ARMS AND FREE MEN* by Vannevar Bush. These are but two examples of controversial books written by distinguished men with which we have been associated. The present volume is still another.

Again, we are not authorities on either air power or military

*strategy, any more than we are on the subject of world government, or advanced science and engineering. Nevertheless, we publish this book as we published ONE WORLD and MODERN ARMS AND FREE MEN—even though, as it happens, those two books contained different, and in some respects opposite, views from those of Major de Seversky.*

*We believe that AIR POWER: KEY TO SURVIVAL is a significant document in the history of military thought and that it will be of great interest and importance to the American public. We are certain that many articles—both pro and con—and possibly books will be written about the present volume, and we believe and hope that thoughtful Americans will read all sides of the story.*

*This foreword is already too long, but we cannot resist quoting from former Secretary of War Robert P. Patterson, who in 1945 released Major de Seversky's report on the bombing of Japan. At that time he wrote:*

*"Major de Seversky made this study as a patriotic duty at my request and at considerable inconvenience to himself. While this represents the personal opinions of Major de Seversky, it merits careful consideration. Whatever Major de Seversky has to say on air power and its future is worth the attention of all patriotic citizens interested in national defense."*

*We present AIR POWER: KEY TO SURVIVAL in this same spirit. In the light of the author's record (which is outlined in the biographical sketch on the following pages), the publishers believe that his analyses and proposals merit earnest and open-minded consideration.*

Richard L. Simon  
FOR THE PUBLISHERS  
SIMON AND SCHUSTER, INC.



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## ABOUT THE AUTHOR

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*Alexander P. de Seversky was born in Tiflis, Russia, on June 7, 1894, and was graduated from the Imperial Naval Academy in 1914. As a naval aviator, he lost his right leg in combat against Germany in July, 1915. Despite this handicap, he returned to active service the following year and became chief of Russian Naval Fighter Aviation of the Baltic Sea. He accomplished 57 combat missions and was credited with bringing down 13 German planes. For his fighting record as well as his tactical and technical contributions to aerial warfare, de Seversky won all the decorations his native land could bestow. He was described at the time by Rear Admiral Doudoroff, his commanding officer, as "one of the most excellent pilots, indefatigable, brave, and a man of inventive powers."*

*After the Russian Revolution, de Seversky was sent to the United States by the Provisional Government, as a member of the Russian Naval Mission, arriving early in 1918. The Bolsheviks having seized power meanwhile, he offered his services as a combat pilot to the American Government. The War Department, however, considered his engineering and production experience more vital and appointed him Consulting Engineer and test pilot.*

*In 1921, as special consulting engineer for the War Department, he worked closely with General William E. (Billy) Mitchell in the historic tests that proved the supremacy of the airplane over the battleship. At General Mitchell's request he began to develop his design of the first synchronous bombsight and was assigned to the Matériel Division of the Air Corps. Rights to the Seversky bombsight, completed in 1923 and called "the best in the world" by General Mason Patrick, then Chief of the Air Corps, were bought by the United States and British Governments.*

Shortly after he became an American citizen, in 1927, de Seversky was commissioned a Major in the United States Air Corps Specialists Reserve. Four years later he launched the Seversky Aircraft Corporation (now called Republic Aviation), of which he was elected President and in which he served as General Manager and Chief Designer. He remained in the company until 1940.

During this period, he designed and built the world's fastest amphibian plane, embodying an array of novel features. The most important of these were a unique amphibian landing gear and the trailing split-flap which later became part of every modern airplane. Flying this airplane, he established a world's speed record for amphibians that has not yet been broken. He designed and built the first all-metal basic training monoplane for the Air Corps; also the first all-metal skin-stressed single-seater fighter plane. Seversky planes won the Bendix 2,000-mile race three years in succession. In 1938 he designed and built the first air-cooled engine fighter with turbo-supercharger for high altitude flying; in its modified production version this craft achieved fame in combat as the P-47 Thunderbolt. At the same time he conceived and developed an array of inventions affecting every phase of aeronautics and aerial weapons (See Appendix for partial listing.).

Despite his executive position in his aircraft company, Major de Seversky made it a rule to flight-test personally all aircraft of his own design. To demonstrate the long range and speeds of his combat planes, he broke a great many speed records. In 1937 he established new speed records between New York and Havana, between Havana and New York, between New York and Washington. The following year he broke the transcontinental record, from New York to Los Angeles in 10 hours and 3 minutes. In 1939 he also set a 45-minute record between London and Paris, and another between Paris and Copenhagen.

When war broke out in Europe and America's entry seemed inevitable, Major de Seversky devoted his energies to the enlightenment of public opinion on the paramount role of air power in modern war. His book *Victory Through Air Power* sold more than half a million copies and was animated by Walt Disney in a movie of



*the same name. Planes, weapons, tactics projected imaginatively by the film became realities even before the war ended.*

*At the Quebec conference in 1943, Winston Churchill requested that the film be flown up to be shown to President Roosevelt. It was after this showing that the Combined Chiefs of Staff decided to give air power the necessary priorities and freedom of action to guarantee control of the air before undertaking a European invasion.*

*In March, 1945, Secretary of War Patterson appointed Major de Seversky his Special Consultant. In that capacity the author went to the European Theater of Operations, then to the Pacific Theater, and the following year to the Bikini atomic tests, to analyze and report on the employment of air power and the effects of bombing.*

*On December 18, 1946, he was awarded the Medal for Merit for his "inestimable contribution to the final victory," as the citation read. Major de Seversky has twice been the recipient of the famous Harmon Trophy. The first time, in 1940, it was presented to him by President Roosevelt; the second time, in 1947, by President Truman in a White House ceremony. The citation read by Mr. Truman underlined his "courageous labors in arousing our democratic public opinion in support of modern and adequate Air Force." (The full text of these citations is included in the picture section which follows.)*

*Major de Seversky has to his credit more than 12,000 hours in the air, most of which were spent in arduous testing of new experimental aircraft. He probably has flown more types of planes all over the world than any other living airman—from the earliest craft to the latest jet planes.*

*He is frequently invited to lecture at military war colleges both here and abroad. His air power thesis is the subject of serious study at such institutions, and his presentations of his views have been enthusiastically received at the Air University in Montgomery, the Armed Forces Staff College in Norfolk, the Strategic Intelligence School in Washington, the National Defence College in Canada, the Royal Canadian Air Staff College. In the course of a recent Latin American survey he addressed the top military and diplomatic circles of Chile, Argentine and Uruguay. He is currently invited to lecture*

*before several European military establishments, including the Royal Air Staff College of Great Britain.*

d Department can engage its campaign. b

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a.

After having served the Secretary of  
 s War ■ an adviser on military matters  
 d and simultaneously blasted in merciless  
 .. writings about everything the Army fr  
 ■ was proposing and doing since 1939, ti  
 - Major Alexander P. de Seversky re- t  
 . ceives the Medal of Merit. What is a  
 i more, he receives it at the hands of t  
 a Secretary Patterson, who must have g  
 y been stung to the quick often enough f  
 s by the Major's widely circulated stric- t  
 n tures. To cap all this the President's i  
 - citation actually praises the Major for  
 having been a goad and ■ pebble in  
 the shoe, who "contributed to the for-  
 mulation of a sound public opinion"  
 and whose appeal "for support of a  
 - vigorous air arm" was an aid in win-  
 - ning the war.

t Such a spectacle probably convinces  
 t the diehards among totalitarians that  
 r this democracy is about ■ mad as they  
 always thought it was. What business  
 - has an outsider to tell an all-wise Gov- i  
 - ernment what kind of airplanes it b  
 3 needs; how many it should build; and o  
 ~ how they should be used, even if he n  
 at did gain considerable experience in the c  
 it First World War? And this Secretary \$  
 10 Patterson, who tolerates all this criti- ra  
 10 cism and who now pins a medal on te  
 ne the critic's breast—what kind of Gov- s  
 ut ernment official is he? There is no n  
 or use in trying to answer. Democracy h  
 ut, happens to rely on that seemingly p  
 1- bumbling yet impressively effective  
 r method of shaping its destiny.

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New York Times Editorial Comment (February 8, 1947) on the awarding of the Medal for Merit to Major de Seversky





A GENERATION OF FLIGHT: *Left*—The author, after his first solo flight, in a Farman-4, pusher-type aircraft, at the School of Military Aviation in Sevastopol, Russia, in the Spring of 1915.

*Below*—Thirty years later, in August, 1945, at Buscom Downs, England, in the British jet fighter, the *Vampire*. He put this plane through its paces during its flight-testing.





*Harris and Ewing*

**HARMON TROPHY:** Awarded by the International League of Aviators to "the world's outstanding airman," this trophy has twice been won by the author, and presented to him by President Franklin D. Roosevelt in 1940, and by President Harry Truman in 1947. Shown with Major de Seversky and President Truman are Mrs. de Seversky and former Secretary of War Robert P. Patterson. The 1947 citation is "for outstanding leadership, patriotism, devotion to the security and aeronautical progress of the United States."



*Associated Press*

# Ligue Internationale Des Aviateurs



## Citation

For outstanding leadership, patriotism, unselfish devotion to the security and aeronautical progress of the United States.

**Alexander P. de Seversky**

is awarded the

**International Harmon Trophy**

1940 - 1946

For outstanding contributions to American victory through his far-sighted advocacy of strategic air power, and his courageous labors in arousing our democratic public opinion in support of modern and adequate Air Force. Mr. de Seversky's combination of scientific, aeronautical knowledge and strategic vision enabled him to serve as a bold missionary of the Air Power cause, and at the same time to implement his ideas by actual design, manufacture and demonstration of equipment in flight. Drawing on his combat experience in the First World War, he foresaw, long before the Second World War, the tactical necessity for the long-range escort fighter. He not only championed that concept but devoted himself single-mindedly to its development. He established the validity of escort fighter principles by arduous personal test flights and through long-distance speed records, risking his life above and beyond the call of duty, as a result, our country was psychologically prepared to apply those principles against the enemy at the crucial moment, thereby winning the control of the air which guaranteed victory.

The White House  
Washington, D.C.

Presented by:

*Harry Truman*

June 24, 1947

*Charles H. Kerwood*  
Charles H. Kerwood  
President

"For outstanding contributions to American victory through his far-sighted advocacy of strategic air power, and his courageous labors in arousing our democratic public opinion in support of modern and adequate Air Force. Mr. de Seversky's combination of scientific aeronautical knowledge and strategic vision enabled him to serve as a bold missionary of the Air Power cause, and at the same time to implement his ideas by actual design, manufacture and demonstration of equipment in flight. Drawing on his combat experience in the First World War, he foresaw, long before the Second World War, the tactical necessity for the long-range escort fighter. He not only championed that concept but devoted himself single-mindedly to its development. He established the validity of escort fighter principles by arduous personal test flights and through long-distance speed records, risking his life above and beyond the call of duty. As a result, our country was psychologically prepared to apply those principles against the enemy at the crucial moment, thereby winning the control of the air which guaranteed victory."



*Press Association, Inc.*

MEDAL FOR MERIT: Secretary Patterson presents this highest civilian war-time award to the author, as General Carl A. Spaatz looks on.

CITATION TO ACCOMPANY THE AWARD OF  
THE MEDAL FOR MERIT  
TO

ALEXANDER P. de SEVERSKY

ALEXANDER P. de SEVERSKY, for exceptionally meritorious conduct in the performance of outstanding services to the United States. Mr. de Seversky, as Special Consultant to the Secretary of War, served as adviser on air matters and contributed to the formulation of a sound public opinion through the medium of his writings from September, 1939 to September, 1946. During this time he drew on his wealth of aeronautical knowledge, his shrewd analysis of trends and his remarkable ability as an observer to bring to the Secretary of War information of the greatest value in the conduct of the air war. He also devoted himself to presenting to the public an appeal for support of a vigorous air arm which ultimately made an inestimable contribution to the final victory. Mr. de Seversky's aerial knowledge, his singleness of purpose, and his aggressive presentation of the beliefs he entertained were of great assistance in the successful prosecution of the war.

THE WHITE HOUSE

December 18, 1946.

*Harry Truman*

## THE LESSON OF KOREA

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As THIS BOOK goes to press, the conflict unleashed by Red aggression in Korea is in its early stages. I have been able to insert a few last-minute footnotes to help the reader relate certain principles and conclusions unfolded in the text to the events in Korea.

Obviously the conduct of a limited, localized battle in an unindustrialized little country is irrelevant to a full-scale world war. But insofar as developments on that Asiatic peninsula affect my basic thesis at all, they provide striking confirmation of the contentions of this book.

The Korean hostilities emphasize sharply the urgent need to re-appraise our whole strategic picture, lest we channel our distinctly limited manpower and resources into profligate strategy that will spell defeat through attrition and bankruptcy. Korea underscores the precarious position in which the United States finds itself. It is a position that must be attributed primarily to confused military thinking, as expressed in the attempt to gear our security to the obsolete strategy, tactics, and weapons of the last war.

To assess the Korean military situation we must begin by acknowledging a crucial fact which has, as yet, been ignored by our opinion-makers. We are able to carry on an old-fashioned ground struggle in that area only because we are *permitted* to do so by Soviet abstention! At this time our Japanese air bases are still unmolested; our supporting sea forces are unchallenged by submarines or air action; our aircraft carriers are allowed to operate in surrounding waters, although they could approach neither Europe nor Japan in the last war until opposing air power had been virtually eliminated.



In a real war against Soviet Russia, none of these conditions would prevail. Our airdromes would be under all-out attack; our air forces would have to tangle at once with the best Soviet aircraft; American supply lines would be hammered from overhead and underseas; aircraft carriers would be committing suicide in venturing into those waters.

Any base on a hostile continent, like Korea—directly accessible to almost inexhaustible Communist land forces and subject to attack by major Russian air forces—would become indefensible from the start. We should be in about the same impossible situation as a European country, at war with the United States, trying to take and hold Florida, a peninsula roughly the size and shape of Korea.

Those who rush to make strategic deductions from the Korean facts, as if a Third World War would merely be a Korea magnified to Eurasian dimensions, are therefore making a serious mistake. It could be a fatal mistake if it should commit us to grinding out weapons for a titanic overseas surface war *on Russian terms*, in which we would undertake to match the Soviets division for division, tank for tank, instead of focusing attention on the development of our potential major strength: air power.

While Korea is irrelevant to a global war, it is demonstrating, as if in a laboratory test, that the United States would be risking defeat in a Third World War if it devoted its restricted military potentials to an old-style mile-by-mile struggle, carried on across thousands of miles of ocean. The exorbitant cost—in men and materials, in tactical aircraft and logistics—of a minor skirmish like the Korean indicates how impossible it would be to apply that kind of strategy to the entire Eurasian continent, against the entire might and resources of Soviet Russia.

During the two years when this book was being written, I publicly expressed my fears that a global war might start with battles on the periphery of the U.S.S.R. and its satellites, which we would mistake as "the real thing."

Those battles, I explained, would siphon off the major portion of our strength and limited manpower into secondary struggles. In our determination to win, we might divert our whole productive setup to the peculiar needs of these indecisive marginal contests. Then, in

the showdown, all those scattered positions (at the end of many thousands of miles of supply lines) would become untenable. A strategic retreat, with huge losses, would be inevitable. And at that point we would find ourselves without adequate vitality and manpower for the main contest, though loaded down with forces and weapons utterly unsuited to the new conditions.

Korea, typical of that sort of peripheral engagement, has confirmed my worst fears. Political commitments and national emotion overrule military logic. We seem minded to throw in all we have to win this skirmish for an area that has no military significance.

But Korea is only the beginning. What if we are confronted with a whole series of "Koreas" throughout Europe and Asia? These would require more and more ground forces and tactical aviation and sea transport, sapping our manpower and productive capacity while involving only a very minor part of the Soviet industrial potential and none of its manpower. In the end we would be left without the strength or the men for a direct, life-and-death conflict.

In the creation of "Koreas," after all, Moscow holds complete initiative. If the Kremlin so wills it, every Korea can be a bottomless well into which we pour American men and machines. The enemy, if he chooses, can funnel in weapons and expendable satellite troops as fast as we can destroy them; and the country we seek to liberate will be pulverized in the process.

It is likely that, by an investment of effort fantastically disproportionate to the military objectives at stake, we shall eventually succeed in driving back the invaders of South Korea. We shall then hand over to a decimated native population the ashes of a land burned and battered by scorched-earth struggles. Communist propaganda in other menaced countries, from Germany to Indo-China, will make the most of this first exhibition of the price of American intervention even when it is successful.

Moreover, we could hold Korea after such a victory only by pinning down a painfully large chunk of our military substance there, and by spending billions for its rehabilitation. We could continue to hold it only on the sufferance of Moscow which, directly or through its Chinese puppets, could always begin a new effort to dislodge us. Meanwhile the Kremlin by tying up a portion of our strength in Korea, at

the end of a 5,000-mile limb, will to that extent have improved its own relative military position.

Most Americans sense that the type of warfare they are watching in the localized Korean struggle is shockingly exorbitant. Numerous recent editorials and radio discussions stress the realization that, if carried out on a world scale, it would involve "insupportable drains" on our strength, implying that such warfare would be beyond our capacity. But most comment shies away from the search for an intelligent solution of this critical problem. Instead it concludes grimly and illogically that we should therefore hasten to mobilize everything and everyone—to fight precisely the kind of war they concede we could not sustain to the point of victory.

Observers who profess to see in Korea the blueprint of any coming war seem to me sadly confused. In particular they are far astray when they suggest that Korea somehow refutes the air power thesis. They fail to grasp that if Korea were a large industrialized nation like the U.S.S.R., a battle for air dominance would have been the inevitable first act in the drama; no action on the surface would have been conclusive until that supreme battle had taken place, and its outcome would have been decisive for the whole war.

But in Korea our almost unopposed access to the skies, while useful, could *not* be decisive. There we have been obliged to use strategic air force in essentially tactical roles, in which it is inevitably inefficient and wasteful.

Tactical aviation, it should be realized, is no more than a weapon of ground force—a superior species of artillery. But artillery is useless unless followed up effectively by the surface forces for which it clears a path. Tactical air force is therefore meaningless without the necessary troops to exploit its action. In Korea it can only hope to destroy enemy soldiers and weapons in the field faster than they can be fed in from the outside—while leaving the outside reservoir of war-making ability intact.

As against ordinary artillery, tactical air force has the advantage of longer range and greater accuracy at long distances. But it is still seriously handicapped by weather, and sometimes by terrain. When the theater of operations is fairly small, a few days of foul weather may allow the enemy on the surface to make full, unimpeded use of



its local surface superiority. Today strategic air force, for all practical purposes, is unimpeded by weather. It can accomplish high-level bombing by radar. Some day tactical air force, also flying by instruments through darkness and all weather, will be able to perform its function by dodging hills, chimneys and treetops like bats, locating and hitting targets with precision. But that time has not yet arrived. Tactical air action is still primarily visual and therefore sensitive to topography, rain, fog and visibility. In Korea during the summer months this has been a considerable factor. In addition, at the start of hostilities our Air Force, like the other branches of our armed forces, was suffering from an acute case of malnutrition.

It is important to realize that *strategic air power, the decisive modern force, does not enter into the Korean equation*. This force is not designed to fight land wars in small and backward countries. There are no genuine strategic targets in Korea. The sources of North Korean war-making capacity lie elsewhere, in Manchuria and Russia. Under the conditions of this localized "police action" we remain technically at "peace" and cannot attack these wellheads of enemy strength. We are constrained to deal with effects, not with causes.

Control of the air would be decisive if it gave us access to the enemy's heart: his industries, fuel, transportation, communications. But Korea's "heart" is located in Manchuria and Russia, well beyond its frontiers, where it is completely shielded by the cloak of a bogus neutrality. No judgments applicable to air power in a genuine inter-continental Russo-American war can conceivably be based upon the Korean experience.

Korea is one of dozens of sore spots which can be deliberately inflamed by the Kremlin—at small cost to itself—to fragment our strength, commit and disperse our resources, and leave us dependent on a world-wide network of supply lines, with all that this means in stupendous merchant marine, naval force and air cover.

If we fall into these traps, if we deploy immense manpower and equipment in Eurasian pockets within easy reach of the major Soviet land-sea-air-and-undersea power, they will be isolated and annihilated piecemeal just as soon as Russia chooses to precipitate the real showdown. The tragedy is that we have been committed to such preliminary actions, in support of insupportable overseas positions.

by policies that did not take account of geographical realities or the limitations of our manpower and resources.

Those who fail to read correctly the lesson of Korea are already trying to stampede the United States into earmarking almost its whole military potential for surface strength—in a foredoomed effort to match the swarming Communist manpower. Unwittingly they are playing into Moscow's hands. *If this country is tied to a strategy in which sheer mass of men and machines tells the story, all the advantages will be on the Communist side.* Whatever the outcome of the Korean struggle, it will be disastrous for the free portion of the world if it should drive America to pour its major resources into outmoded surface struggle.

In that kind of war we would from the outset be forced to divide our resources three ways, attempting to maintain the largest possible land, sea, and air forces at the same time. Meanwhile, Russia, fighting on its own self-contained continent without dependence on overseas supply lines, would need to divide its potential only *two ways*: land and air. Given the overwhelming Soviet superiority in manpower for fighting and production, this handicap could in itself condemn us to defeat.

Fortunately, there is an alternative. It is presented in the pages that follow. If we take the Korean episode to heart, it will alert us to the danger of staking our security on surface strategy. In that event the Kremlin's first military aggression may prove to have been too early, giving us a timely tip-off on the futility of fighting an old-fashioned kind of war.

It is my firm belief that, no matter how a Third World War starts, we shall be expelled from the Eurasian continent. There simply are not enough Americans to fight a ground war against nearly a billion people in the Soviet sphere. Our technological superiority can never balance our logistic handicaps and our critical shortage in manpower. Wherever we deploy our strength on the Soviet continent, we shall be faced sooner or later not with Dunkirks, which would be bad enough, but with Bataans. After which we shall inevitably be thrown back, our vitality uselessly depleted, upon the strategy which this book urges that we adopt *without further delay*.

In the last war we were expelled from the entire South Pacific

despite assurances by top military spokesmen that our "invincible fleet" could sail directly into the China seas and crush Japan in a matter of weeks. That calamity, still fresh in national memory, took place because our strategy was wrong, bogged in the mire of World War I experience. The situation today is parallel. Our present strategic ideas are similarly bogged in the mire of World War II experience. Unless there is an immediate and drastic change in our military thinking, calamities of the same order should be expected.

We are now wide open to the exhausting drains and humiliations of an endless series of militarily futile little wars—Korea today, Formosa, Indo-China, or Iran tomorrow—at *times and places selected at will by Russia*. Our answer follows no predetermined and specific strategy, but merely reacts to calculated enemy provocations.

Diplomacy seems to be losing effectiveness, and fast. The Communist side has resorted to raw force. The time has come, therefore, when hard military considerations must have the right of way.

We must have the intellectual and moral courage to recognize the vulnerability of purely ideological and prestige outposts, and to withdraw to positions within the limits of our strategic realities. We must do this not under enemy pressure but in an orderly manner, as an obvious indication of our determination to be ready for an all-out offensive. As a result of their own historical experience, the Russians know better than most peoples the implications of strategic retreat. The aggressor will realize that we are acting to consolidate our position. He will be put sharply on notice that we are generating invincible force in the decisive medium of this epoch—the air—where we can have not only superior quality but also overwhelming quantity; that we plan to by-pass his sprawling surface might on the Eurasian continent and destroy directly his industrial sinews for war-making. Only thus can we be genuinely prepared for victory in the showdown battle.

We are being fair neither to our allies nor to ourselves in fostering illusions that we can win a global war on the surface of a hostile Eurasia. We *can* deter or emasculate attacks on free nations that have the will and capacity to resist aggression. But we can do this *and win* only if we possess invincible air power for direct interhemispheric warfare, geared to destroy enemy strength at its very source. This is

the crux of true modern strategy—and this is what we are precluded from applying in the Korean episode.

Once we resolutely and openly adopt such a strategy, and put all our resources behind its speedy implementation, we may head off that debilitating series of "Koreas" which promises to chew up our military potentials and fighting youth. For we shall then be confronting Moscow with the threat of deadly retaliation that can, if necessary, be carried to the limit of total victory.

## CRISIS IN NATIONAL SECURITY

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THE MOMENT seems to me critical. We are today in the initial stages of a large-scale rearmament program. If allowed to congeal in fallacious patterns, security plans will commit us irrevocably in terms of industrial setup, allocation of materials, training of our youth, foreign policy. The time to shape our strategy rightly is now, and the responsibility rests with our entire citizenry.

Modern war involves the total energies of a nation. The scope and nature of military preparedness affect the very character of its civilization. Mistaken military ideas, if they commit us to an intolerable drain on our limited manpower and resources, may well condemn America to gradual regimentation even in peacetime and to the risk of defeat in war. And in the crucial hour, when blunders are too palpable to be denied, we shall be told—as we were in the darkest hours of the last war—that “we must fight with what we have”; that we cannot fight “today’s war with tomorrow’s weapons.”

The present challenge is far more serious than any in the past. To begin with, the looming dangers are greater. Delusions of geographical isolation have faded. Should war come, America, its cities, industries, communications, and population will be the main targets. It will be a struggle between two worlds, two ideologies, with absolute victory as the only conceivable goal, no matter how frightful the costs.

This time we would not be able to gamble on a vast preponderance of manpower, resources, and industrial capacity to make up for erroneous strategy. We shall face a foe with total resources and manpower greater than our own.

In World War II we smothered the enemy with the sheer weight

of men and machines. Where combat quality in weapons was lacking, quantity—plus the valor and resourcefulness of our fighting men—in the long run told the story and in the process, alas, concealed blunders. We could experiment, improvise, duplicate weapons and strategies, make false starts—and get away with it. Like a heavyweight in the ring with a featherweight, we could hit out blindly, squandering energy recklessly, and expect to knock him out anyhow. Even at that, victory remained dubious until we turned air power loose to fulfill its strategic destiny.

Should a third World War be forced upon us, we shall assuredly have no such comfortable margins for error. We may not even have the time to make major shifts in war plans, as we did several times in the last war. American strategy must be rightly conceived and rightly implemented from the start. It must be geared to our country's specialized talents and technical advantages to make up for the quantitative superiority of a potential adversary who may have the entire Eurasian continent and nearly half the human race at his disposal. Like David facing Goliath, we must choose the proper weapon and score a strategic bull's-eye.

That is why this book is being written. A strategic choice fateful for our country and therefore for all mankind must be made quickly—and only the American people can make it. They must choose between outmoded methods and a historic opportunity to make their country supreme in terms of new methods.

In many respects the problems confronting us at this juncture are analogous to those we faced on the eve of World War II. Then, as now, the forces of inertia and habit were aligned against the imperatives of technological progress. Then, as now, military leadership had been placed in the hands of men unfamiliar with and psychologically hostile to the new strategic possibilities inherent in air power.

The conflict between orthodoxy and innovation is not new. But it is made more acute today by the unexampled rapidity with which science and invention are moving. A backward look at the immediate past is indispensable for an intelligent appraisal of the immediate present.



It was anxiety for the safety of our country that impelled me, from 1938 forward, to address myself to the American people over the heads of the military hierarchy in Washington on the subject of air power. This I did to the best of my ability in articles, radio talks, lectures; in a book called *Victory Through Air Power* \* and its translation to the motion picture screen by Walt Disney. Being neither a writer nor a speaker by training, I undertook those activities reluctantly, only in deference to my conscience as a citizen.

I had just severed relations with the aviation company bearing my name, because I had insisted on designing and building—with company funds—a high-altitude long-range escort fighter. I was convinced that such a plane would be needed if war came. But the military command could not visualize any use for escort planes, and my company saw no sense in manufacturing goods “the customer” held in contempt.

The assumption that “the customer is always right,” a premise that is beyond dispute in the shoe or canned goods business, seemed to me most dangerous where the security of my country was at stake. In due time the disputed fighter helped win the war, for it was the prototype of the P-47 Thunderbolt. Meanwhile, ironically, release from the confinements of business gave me the time for the air-power crusade.

The weapons America was then building and the strategy they implied seemed to me unrealistic in a world entering the air age. Having devoted my whole life to aviation and military science, I was deeply aware of the neglected aeronautical potential. I watched the unfolding global struggle from a vantage point not alone as a designer and builder of aircraft and an inventor of aeronautical devices but as a combat pilot. And I was appalled by the continuing emphasis on battleships and bayonets, by the routine disregard of air power, especially as a long-range strategic force.

Through sheer habit America was being prepared to fight battles of the Argonne 1917-style on land and battles of Trafalgar and Jutland on water, as if nothing had changed. The Army budget for 1940, drawn up in 1939 by our General Staff, provided for a miscellany of

\* Simon and Schuster, 1942.

aircraft but only six Flying Fortresses, and these primitive in their military characteristics. As Hitler detonated another World War, "the United States did not have a single service-type plane for actual combat operation," according to General H. H. Arnold, himself among the planners of American security.

The assumption that battleships represented our "first line of defense" was sacrosanct. To doubt it was to court ridicule and a kind of ostracism. "A battleship is so heavily armored," Admiral William V. Pratt assured millions of American people on the radio, "that when a bomb strikes it, the force of the explosion goes upward, into the air, and very little damage is done." \* An orthodox press analyst, Hanson W. Baldwin, wrote that "the plane has not made the battleship . . . any more obsolete than the submarine did." † In the perspective of time such statements sound grotesque. But to question their validity at the time seemed eccentric, to say the least.

More than two years after the outbreak of the war in Europe and months after America was in the maelstrom, our aircraft were still far down on priority lists. To the men who were then—and in part are still—shaping our military fate the new struggle was simply a continuation, with modern trimmings, of the strategy and tactics of World War I. This despite the fact that from September, 1939, to Pearl Harbor day they had a grandstand view of conflict under the changed conditions and in a new dimension; of a war of movement spear-headed by air power, wholly unlike the trench war of static position of the past.

Poland was quickly crushed by Panzer divisions rolling under a shield of air power. The Maginot Line, repository of the resources and the hopes of a great nation, was by-passed with ease. Though separated from the mainland by water, Norway fell to an invader devoid of naval force, in defiance of massed British sea power. The German invasion of the Scandinavian peninsula had been hailed as Hitler's strategic blunder, his self-entrapment.‡ Yet Britain's own

\* American Forum of the Air, June 11, 1940.

† *Life*, December 1, 1941.

‡ From Winston Churchill's report to the House of Commons, April 12, 1940: "Hitler's action in invading Norway and Scandinavia is as great a strategic and political error as that committed by Napoleon when he invaded Spain. . . . He will now have to fight, if necessary, during the whole summer against powers pos-



back yard, the North Sea, was soon denied to the Allies by Hitler's air power from Norway.

Then came the Battle of Britain: almost a laboratory demonstration of pure aerial warfare, in which the surface forces were reduced to helpless bystanders. Because the defending aviation was superior to the invading aviation, all the spokesmen of "true and tried" surface strategy shouted in gleeful chorus that air power had "failed." They literally refused to listen to those who explained that, on the contrary, air power had succeeded magnificently—succeeded in warding off an invasion.

The Mediterranean had always in the past been the natural arena of superior sea power. The general expectation that it would remain a "British lake" was consequently beyond serious discussion. "British sea superiority in the Mediterranean, despite the appearance of squadrons of Stukas, is greater than ever," Mr. Baldwin stated.\* It seemed headstrong heresy when airmen, following the logic of the new relationship of forces, suggested that air power would decide the fate of that sea. But by February 16, 1942, Prime Minister Churchill was constrained to announce: "The Mediterranean is closed and all our transports have to go round the Cape of Good Hope." The orthodox analysts were thus again off the beam.

The foresight made possible by the air-power vantage point was not a matter of "prophecies," a word implying guesswork and crystal-ball gazing. The architect who designs a building taller than any yet in existence is not a soothsayer because he foretells accurately that the structure will stand up. He is merely projecting into the future on the basis of known scientific principles. Airmen viewing the new war were in about the same position. When we foretold that war-making would inevitably be revised in certain predictable directions, that old rules would be canceled out by new conditions, we were not engaging in crystal-ball magic. We were simply projecting the vast combat experience of the past—World War I, China, Spain—into the evolving future, in terms of the new technological progress.

Early in 1941 Mr. Baldwin had reassured his readers that "so long

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sessing vastly superior naval forces and able to transport them to the scenes of action more easily than he can."

\* *New York Times*, February 23, 1941.

as the United States Navy is in Hawaii, it seems unlikely that Japan will make a decisive move, unless the move is one of desperation." \* He was merely reflecting opinion on the highest planning levels. The view that Japanese offensive against Hawaii was a strategic impossibility was standard and orthodox.

Airmen sought to warn against such smug illusions of safety. In February, 1941, I wrote in an article assigned by *Liberty*: "If the Japanese succeed in extending their air power to the shores of southern China, they would for the time being have the upper hand tactically in the Far East. . . . No hostile navies could then defend the East Indies or any of her objectives under that 'awning,' since such navies would find it too costly to move under the skies held by the enemy."

The magazine rejected the article. Its editors said they could not risk climbing out on a limb with such wild predictions. The very idea that Japan could oust us from the South Pacific in the face of our invincible Navy, they assured me, seemed too grotesque to present to American readers.

The Pearl Harbor calamity settled that argument for all but the most diehard traditionalists. In one swift blow from the skies it demolished a generation of Army-Navy planning. It made the old assumptions and the standard weapons and orthodox military education largely irrelevant. Battleships were sunk from the air. "Impregnable" naval bastions fell to the Mikado's aviation and we were virtually expelled from the Pacific.

These cumulative humiliations, however, could make no dent in the military obsessions of our high command. Indeed, like fond parents whose children are in peril, they rallied zealously to the defense of the battered principles of surface warfare. For most of them it seemed a matter of honor to argue the new facts out of existence.

The terrific possibilities opened up by long-range aviation were brushed aside contemptuously in favor of "time-tested" and "reliable" weapons. The standard retort to all criticism of equipment and strategy was, "We must fight with what we've got," although what we had was of their own making.

But why did we not have the new weapons when they had been

\* *New York Times*, February 23, 1941.

technically possible for many years? Why did other countries, friend and foe, possess some of the alleged "weapons of tomorrow" while the United States, native land of modern aeronautics, was continuing to build militarily inferior planes? To such questions there was only one stereotyped answer: that the American people had not provided enough funds. But that was an alibi, not an answer. Lack of funds explains inadequate quantity; only lack of strategic understanding and experience, failure to study military aviation, can explain inadequate combat quality.

MY EFFORTS, and those of other alarmed airmen, to break through the inertia of our military leadership by direct pleading had failed. We were up against tradition, rule-of-thumb, the textbook mentality, impervious to the logic of new technological facts. Only the democratic remedy remained: an open appeal to the common sense of our people.

An enlightened public opinion, I believed, could serve as a corrective on the innate orthodoxy of a great military organization rooted in glorious traditions and held back by inherited ideas. That faith was to be amply justified.

We were under no misapprehensions about the reaction of those whose vested interests or vested errors had to be exposed. I knew that officialdom would be infuriated by my seeming intrusion upon their preserves. I foresaw that certain business groups would be outraged by the threat to their huge investments in inferior or inappropriate airplanes, engines, and weapons which they were then advertising as "the finest in the world," as if adjectives could make up for insufficient armor and firepower.

I was prepared to take the consequences, and I was not disappointed. The brickbats came thick and fast. My views were reviled as visionary, extreme, irresponsible, crackpot, and—most distressing in time of war—unpatriotic. My motives were impugned. Even the plain facts of my professional career as combat pilot, designer, and inventor were twisted out of shape to diminish my authority.

Air Corps people who befriended me or consulted me (as so many did in conspiratorial secrecy) knew that they were risking their of-

ficial heads. I was charged with "hurting the war effort" and "doing a disservice to the cause of air power." My strictures on backward aircraft were castigated as a blow to fighting morale in the aviation ranks, though fliers from every front wrote me urging that I continue to tell the truth. Toward the end of 1942 the War Department actually called in a New York publicity man to assay "the Seversky problem." His assignment was to discredit me, and I must concede that he did a fairly effective job. A friendly editor informed me that "a lot of fellows had been around peddling exposés" of me.

The peddlers did a thriving trade. This was the period when one popular magazine featured an article elegantly titled "Victory Through Hot Air Power."\* *Life* contributed to the smear with a fantastic article crediting one of my assistants, Alexander Kartveli, with the conception and design of my planes. The idea, of course, was to cut me down to size as a designer. *Life* eulogized him, amusingly, for the basic design of the amphibian from which stemmed all my fighters.† If anyone deserved a share of credit it was the well-known aeronautical engineer Michael Gregor, who assisted me on that job—a long time before Kartveli was even hired.

Major General Paul B. Malone came through with an attack on my World War I combat record. ‡ The true details were available to him in *Who's Who in Aviation* and other standard biographical works. But he preferred his own version—that the engagement in which I lost my right leg was my first and last fighting experience. Actually, such honors as came to me as commander of Russian naval fighter aviation in the Baltic were won in years of fighting after my leg was shot off. Luckily two of my former chiefs were in this country, and they took care of the General neatly.§

Some of the more vitriolic name-calling, I am sorry to record, seemed to stem from certain manufacturers and salesmen, concerned with concealing the defects of their wares. Thus the trade journal *Steel*, echoing some anonymous "aviation people," scrawled the words

\* *Pic*, January 5, 1943.

† *Life*, October 5, 1942.

‡ *Skyways*, "Victory Through Air Prophets," November, 1942.

§ Letters of Admiral Boris Doudoroff, dated December 29, 1942, and Captain A. Toochoff, dated November 23, 1942, to the editor of *Skyways* magazine, in answer to Malone's article. See Appendix.



*Drennan*

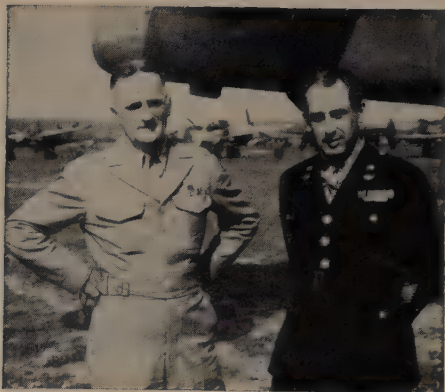
**AIR FORCE OFFICERS-TO-BE:** The author addressing cadets at Mitchell Field, N.Y., after his annual demonstration of combat maneuvers and acrobatics, before the last war.

**LONG-RANGE SEVERSKY FIGHTER:** Designed and built by the author, 1937-39. This type won the 2000-mile Bendix race three years in succession; piloted by the author and others, it established many speed and distance records.

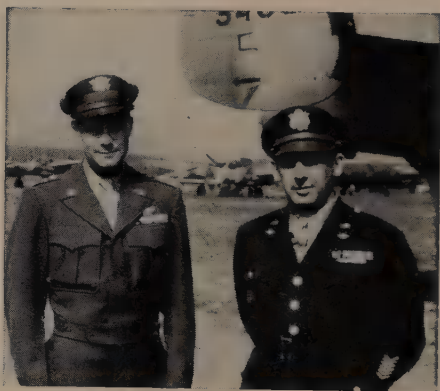




Major de Seversky, with General Carl A. Spaatz, immediately after the interrogation of Marshal Hermann Göring, in Augsburg, Germany, May 10, 1945.



With General Hoyt Vandenberg, present Chief of the Air Staff, also after the interrogation of Göring by the author and Air Force leaders in the European theater.



With General Jimmy Doolittle, during a visit to Eighth Air Force Headquarters in England, March, 1945.



“charlatan” and “quack” across my character.\* Its principal objection was to my criticism of the Curtiss P-40 pursuit airplane, powered by a General Motors Allison engine—and its principal source of information was one Don R. Berlin, a General Motors engineer who had designed the P-40 when he was with the Curtiss Company.

Another species of attack was frankly political, from the extreme left, with the Communist New York *Daily Worker* setting the pace. My warning against invasion of the European continent before we had won superiority in the air militated against the “second front” propaganda touched off by Moscow and therefore made me unpopular in those quarters. Willy Ley, in the New York *PM*, directed his choicest satire against my absurd insistence that airplanes could and should use “rocket artillery.” He showed, to his own satisfaction, that this simply could not be done.† Amazingly, this man continues to style himself a rocket expert.

I do not flatter myself that I personally rated such concentrated fire. In retrospect it is clear enough that the barrage was aimed at all those, within and outside the military establishment, who were seeking to pry strategic thought out of its earthbound rut. It was backed up enthusiastically by those who had a private stake in covering up bad judgment and bad equipment; and it was helped along insidiously from time to time by alien influences eager to retard development of our air power.

Fortunately, American editors and publishers, radio stations, and public forums for the most part saw the wisdom of presenting the “heretical” air-power views, whether they shared them at the time or not. Slowly, but inexorably, the weight of public opinion made itself felt. A lot of it came from airmen on the fighting lines. The boastful advertising tapered off. In time the attacks on air-power advocates became fewer and more restrained. Some of the very officials who had honestly regarded me as a “problem” and a “menace” in the earlier stages of the war accepted me as consultant and confidant on aeronautical affairs before the war ended.

As Undersecretary of War, for instance, Judge Robert P. Patterson had been active in opposing my viewpoint. Once he came to recog-

\* *Steel*, September 14, 1942.

† *PM*, December 8, 1942.



nize the validity of my general contentions, however, he had the courage to draw me into the war effort, despite the continuing hostility of some of his brass. He sent me as his special consultant to the European and Asiatic theaters of war to survey the effects of strategic air power in action, and later to Hiroshima, Nagasaki, and Bikini to appraise the impact of the atom bomb.\* This was a striking exemplification both of the man's personal integrity and of the advantages of our system of freedom.

In a Fascist or Communist country, as a forthright opponent of the official strategy, I would have been swiftly "liquidated." In our America I was in due time awarded the Medal for Merit and the International Harmon Trophy. The citation accompanying the trophy, as read by the President of the United States, referred to "courageous labors in arousing our democratic public opinion in support of modern and adequate Air Force"—that is to say, my very opposition to official policies! †

I allude to these facts in no spirit of vainglory but as an indispensable prelude to this, my second book. For once more I venture to challenge the official military concepts.

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SOME TIME AGO Air Marshal Trenchard, the great British Air leader, expressed the hope that I would write a purely technical book addressed to specialists, airmen, and military people, summing up the strategic thesis advanced in my first book. I explained to him that this had, in fact, been my original intention. But the situation had become so urgent, the need to arouse public interest and enlightened opinion so compelling, that I chose instead to write for the general public.

With the end of the war, and the emergence of so many new technological factors—jet and rocket propulsion, guided missiles, the atom

\* The findings of this survey may be found in the following War Department releases: "Report of Major A. P. de Seversky to the Honorable Robert P. Patterson, Secretary of War," September 27, 1945; "Major de Seversky's Report on Pacific Air Power," February 19, 1946.

† In this connection, see New York *Times* editorial, page xvi. Also letter from General Andrews, in Appendix.

bomb—I again contemplated a technical treatise for professionals. I accumulated notes and data for that purpose. Meanwhile, however, the worldwide political picture deteriorated rapidly. The danger of war became increasingly sharp. Once more I came to feel that the American people, rather than the experts, held the key to our security. And once more I considered it essential to address myself to a popular audience. I have no doubt that the Air Marshal would second my decision, and will understand why I avoid, as far as possible, professional terminology and definitions.

The thesis of this book rests on three basic convictions which I sum up at the outset and shall seek to prove later:

1. *The premises on which strategy is now being formulated in Washington are fallacious and have in them the seeds of disaster.* In essence we are preparing to fight the next war with the methods and weapons of the last—preparing, that is to say, for the kind of conflict that will never again take place. We aim to make ourselves maximally strong on land, on the seas, and in the air. Considering the geographical equation, such strategy is untenable. It is extravagant beyond our capacity and therefore doomed to failure. The staggering burden which it loads upon our economy threatens not only our standards of living but our standards of economic and political liberty.

2. *A strategy for victory is open to us: a strategy geared for global command of the air, to guarantee freedom of air navigation, exercised directly from the American continent.* This can be implemented with air force of interhemispheric range, endowed with the combat vitality to go anywhere, to do the necessary, and return non-stop to its home base. It is a plan supremely suited to the native industrial talents and scientific leadership of the American people and fully in accord with present aeronautical facts. Moreover, because it focuses effort in the one decisive medium, it is within our means.

3. *The correct strategy, boldly conceived and based on the unique character and qualities of our free American society, will tend to guarantee peace.* It will serve as an effective deterrent to would-be aggressors, because no unfree society can hope to match us on the highest levels of technology, skills, and individual initiative, expressed in their ultimate in modern air power.

I am mindful of the gravity of these assertions and of my responsi-

bility. The very fact that my appraisals of the last war have been substantially confirmed by experience deepens my sense of moral obligation. It suggests the possibility at least that this book, being bolstered by the authority of its predecessor, may find even greater credence.

But the role of the American people, as I see it, is not passively to accept and pay for decisions on national security. It is their right to know all the alternative concepts and their duty to take part *actively* in formulating overall strategic decisions. The key word is "strategic." Military strategy can be most simply defined as a general plan to overcome the obstacles of geography. Tactics is the process of actually overcoming these obstacles by the most efficient means. That is why tactics and weapons are the province of military specialists and must be kept secret. But strategy, the large plan of war, which today involves the total energies of a nation, is the province of the people.

The prevailing mode of transportation of every epoch has always been at the root of the contemporary military strategy. Today the air is the most efficient medium through which to overcome geography and carry war directly to the enemy. Air force thus has become today's primary military force.

It would be against nature to expect the elder military services virtually to sign their own retirement orders, to accept military views that demand their assignment to secondary strategic roles. I am not impugning their patriotism; unquestionably they believe deeply every fallacy they champion. But time is running out. In the last analysis the American people, whose voice is supreme in our republic, must determine the military course through their elected representatives. They cannot afford to delay. If the leverage of public opinion can be brought to bear, we can have peace through air power.

## PEACE THROUGH AIR POWER

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THE UNITED STATES has amply demonstrated its will to peace. None of its neighbors is alarmed by its might and wealth. None of the weaker, smaller nations anywhere in the world slept less soundly when the atom bomb was exclusively in American keeping, or because bombing aircraft of interhemispheric range were coming out of American plants.

In the conduct of the recent war we showed an extraordinary lack of interest in favorable strategic positions for ourselves, while conceding them blithely to others. Our whole attitude was "non-political" to the point of being frivolous. For our statesmen and generals the war was a kind of global heavyweight-championship bout. They were concerned only for a speedy decision, without much thought of the future. You knocked out the challenger, waved happily to the cheering fans, and went home to the wife and kiddies—until a new challenger arose.

Our British allies, instructed by long experience in world affairs, were rightly worried about the size and disposition of the various victorious forces at the war's end. They were eager, for example, to intercept Soviet westward expansion and therefore wished to drive a powerful military wedge into Eastern and Central Europe. But Washington turned thumbs down on the invasion of the Balkans for which Winston Churchill pleaded. It even resented such far-sighted purposes as irrelevant to the job in hand of finishing off the Axis.

We did not as a nation understand the fact that politics are inseparable from war-making; that victory often poses more questions than it answers. By this time most of us have learned this bitter truth. But

whatever our wartime policies prove about the American mind in world affairs, they also underline our instinctive and almost childlike faith in peace.

The United States took the lead in fashioning the United Nations; it paid off the Kremlin with concessions and appeasements for promises of co-operation. Despite cynical violations at the Soviet end, we have lived up to wartime bargains and commitments, some of them distasteful, and others—the sacrifice of Polish interests, for example—close to immoral.

Having finished the war with a monopoly of the most destructive weapon in all history in our hands, the A-bomb, we offered to internationalize it, to share our costly special knowledge with the whole world. A more dramatic demonstration of its will to peace has rarely been given by any great nation. We need only imagine what would have happened had the situation been reversed, had the Soviets alone possessed the bomb, to savor this fact.

Usually through history countries that acquired immense wealth and power developed at the same time strong appetites for influence and territory. The United States is the first great exception. It has actually sought to run away from the opportunities and obligations of its strength. It has accepted leadership unwillingly and only under pressures not of its making.

There are those who raucously deny our peaceful temper and intentions. They try to paint us as “warmongers” and “imperialists.” They twist our help to stricken peoples and menaced nations into cynical schemes for subjugating other countries. But the accusers themselves, it is obvious, do not believe their propaganda charges. If they did, they would be more restrained and circumspect in their behavior; one does not bait atom-bearing “warmongers” and trigger-happy “imperialists” so recklessly. It is impossible to avoid the suspicion that the masters of the Kremlin are speculating on America’s hatred of war and its traditional instinct for isolation. They are gambling on a shrewd guess that America will put up with a great deal rather than risk a new war.

If we are again looking to our national defense, it is under the compulsion of alarming postwar events. Reluctantly we have admitted that resort to war remains a possibility—and that American weakness

represents an irresistible temptation to aggression. At least until the hopes reposed in the United Nations are justified, there seems to be no alternative to adequate American military preparedness.

On this point there is by now general agreement among the American people. In a turbulent period, facing an aggressive ideology pretending to world hegemony, we must be incomparably strong. That, however, is the beginning of wisdom, not the end. We must ask ourselves, "What kind of strength?"

Since our fundamental national purpose is the maintenance of peace, it should be the kind that will act as a *deterrent* upon any would-be aggressors, that will leave no doubt about our military supremacy. Anyone rash enough to challenge us must be deeply aware that, no matter how terrible and destructive the contest, his chances of winning are almost nil.

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IN THIS LIGHT, it seems to me reasonable to begin with a frank recognition that Soviet Russia's strongest suit is *mass*—in manpower, natural resources, geographical space.

Now, as always in history, the strategy of Russia is geared to numbers, to lavish expenditure of life and matériel. A backward empire repeatedly in collision with the advanced West, it has learned to rely on size rather than subtlety, on quantity rather than superior skill. It has made a virtue and almost a military science of its essential awkwardness. Strategic retreats, scorched earth, huge casualties like those absorbed in the Napoleonic invasion or by Leningrad and Stalingrad in the last war, are quintessentially Russian methods.

Hitler's armies, like Napoleon's before him, cut deep into Russia, only to be bogged down in its measureless spaces and ultimately smothered by its multitudinous peoples and their capacity for taking punishment.

In these postwar years the sheer mass has been growing. Some 125,000,000 East Europeans, along with their foodstuffs, their ancient skills, their factories, have been added to the Soviet potential. The Communist conquest of China has placed several hundred million more people and the economic substance of Manchuria at the Kremlin's disposal. The normal Russian advantage of quantity has thus been



immensely expanded. And the end is not yet; there is no doubt that the Soviet drive, certainly in Asia, will be continued.

The hard-boiled materialist philosophy of the Bolshevik rulers is in itself a quantitative factor in their favor. They do not place our high evaluation on human life and have no moral squeamishness about sacrificing tens of millions of their subjects, if need be, to promote their purposes.

If we choose to outbuild the Soviets, to match them in the magnitude of their expendable men and machines, we shall be accepting the contest *on Moscow's terms*. There is nothing the Kremlin would like better than an American decision to stake the ultimate outcome on mere numbers.

Far from deterring them, such a decision would inflame their cupidity and inflate their self-confidence. Soviet Russia will never be deflected from its expansionist aims by universal military training in the U.S.A. and the resurgence of armed divisions in Western Europe. Those things mean land war, in which Soviet Russia holds the trump cards. As for sea warfare, Russia has no navy, needs no navy, and fears no navy, recent propaganda from both the Kremlin and the Navy segment of the Pentagon notwithstanding. Sea power can be no real threat to a self-contained continent unafraid of blockade and in no way dependent on overseas lines of communication.

No, the Soviet rulers will not be deterred by a challenge on the surface, where mass is likely to tell the story. They will be truly worried only when we choose to outthink them rather than outbuild them; when we make clear our intention of pitting our skills against their numbers.

For *skill*, expressed in the superiority of our strategy, tactics, and weapons, is America's strongest suit. I am not alluding merely to our edge of superiority soldier for soldier, tank for tank, plane for plane. That is important. But it is an edge that can be wiped out by an enemy's sheer mass, by his ability to weather a duel of attrition.

I refer rather to the overall superiority of our civilization—our science, technology, industrial know-how, inventive genius, democratic flexibility. I refer to the personal aptitudes and initiatives of the average American, nurtured by generations of freedom and self-reliance. These are advantages inherent in our way of life.



And what, in this day and age, represents the most advanced, most mechanized, most technological type of warfare? The answer, of course, is air power of the longest available range, carrying the most effective available weapons for taking command of the air.

Once we relate our military preparations to this reality, we will be forcing any foe to fight *on our terms*. We shall put ourselves, to that extent, in the position of the small company of Spaniards armed with muskets facing hordes of Indians armed with bows and arrows. A nation industrially backward and politically hog-tied cannot hope to meet us as an equal in a contest that is basically scientific and technological. On those commanding heights strategy mirrors a country's stage of development.

There we have no peers. There our paucity in manpower ceases to be a handicap, for machines and ingenuity become substitutes for men. In efficient destruction, no less than in efficient production, technological progress reduces the number of workers employed.

If we consent to keep war-making on the surface level, where mass is decisive, we shall be throwing away our margins of natural advantage. It is as if, competing with China or India in the production of some industrial item, we elected to depend on hand labor instead of the most efficient machines.

Were a country like Russia to imitate us by reproducing the physical instruments of modern warfare in the air, it could scarcely hope to keep them attuned to efficient operation. These intricate scientific products do not function in a void. They are closely dependent on their environment for myriad gadgets and refinements, instantaneous replacements, rapid hairline modifications. These in turn call for individual incentive, personal initiative, and technical skills of a high order.

Suppose we made some retarded country a present of the most advanced air-power complex—intercontinental planes, rocket and atomic weapons, fuels, everything—in amounts equal to our own at a given moment. Suppose that war between that country and ours were to break out. How would the contenders stack up soon after the equal start?

The answer can be given by anyone who has seen complicated and delicate modern machinery imported by a relatively primitive society

after a period of intensive use. It always shows terrific wear and tear, if it has not broken down altogether. Untrained personnel, unfamiliarity with the nature of machinery, quickly undermines operation. In the higher reaches of modern industry efficient operation presupposes a society in tune with the process. In any case, the requisite skills cannot be taught to peasant boys overnight. They imply generations of technical familiarity and adaptability.

Military preparedness in Soviet Russia is of necessity based on quantity. The country has no alternative. It is deeply conscious that it cannot challenge us where sustained creative skill is the decisive factor. Hence the Kremlin leaders no doubt are delighted to see that America is preparing essentially for an old-style surface war.

The United States does have an alternative. The choice open to our country is between two fundamentally different and incompatible methods of waging war—one geared to mass, the other to skill. They are mutually exclusive methods, since the effective implementation of both is beyond the economic capacities of any nation.

The general direction of military thought on the highest official levels is already apparent and, in my view, tragic. Unless halted and reversed by an aroused American public opinion, it will commit us not only to supreme military hazards but to economic bankruptcy and its attendant dangers to our free way of life.

Our military leaders are still too evidently obsessed with mass, numbers, variety. They have made a fetish of "balanced forces," which to them means the largest possible Army, Navy, and Air Force at the same time; the indiscriminate stockpiling of every conceivable weapon for every conceivable purpose; a utopian attempt to be maximally strong in every dimension, to match the teeming surface forces of all Eurasia division for division.

That, of course, is the path of least resistance. If no service gets all that it wants, at least each one gets a substantial part of what it wants and everybody is happy. This very profligacy provides an industrial role and profit for every butcher, baker, and candlestick maker, which makes such a path politically expedient. Since it aims at maximum strength in all elements, it evades the need for a real decision and the need for a genuine intellectual appraisal of the new military relationships.

This concept, though its translation into weapons has only been started, is already putting a painful squeeze on the American economy. The industrial effort it calls for must in time involve our whole population, from children to the aged, in the productive process. At the same time it foresees the withdrawal of from ten to twenty million of the most vigorous young men from our labor pool for armies and navies vast enough to match those of the expanding Soviet bloc. Little wealth or energy or manpower will remain for normal peacetime economic life. Without being conscious of the drift, we shall be driven rapidly toward the militarized society, with all that this implies in political and social terms. Such is the logic of war plans based on mass.

The alternative strategy—to which this book is dedicated—starts with the understanding that for us reliance on sheer mass is no longer possible or, for that matter, necessary. It demands a clear-cut and clear-headed decision as to which is the dominant force for victory under today's conditions—and the deliberate channeling of our major resources into its perfection.

In the following chapters we shall explore the fallacies of the profligate land-sea-air blueprint and the feasibility of an all-out air strategy, with surface forces primarily as supporting elements. At this point my purpose is to underscore the potentialities of air strategy in terms of peace. Combat raised to the highest technological level, because it implies a contest on our own terms in the medium where we can make ourselves supreme, is most likely to act as a brake on aggression and to promote peace.

FROM 1815 to 1914 the world enjoyed an amazing stretch of comparative peace. It was the century in which modern civilization came to fruition. More scientific, industrial, and political progress was crowded into it than in any preceding century in man's career on this planet. Most important of all, the liberal-democratic idea, based on the free and dignified individual, had its fullest unfoldment.

We need not romanticize the period in order to concede its relative greatness. There were towering social evils left over from the feudal past and new ones hatched by modern industrial conditions.

But most of the world was at peace most of the time and consciously wrestling with those evils.

All this and more was possible in the first place because a small island off Europe in effect imposed upon mankind what has come to be known as the *Pax Britannica*.

It should be noted that England was able to do this though its population was small and its resources were limited. It did not have to militarize or regiment its people; on the contrary, the range of its social freedoms and individual rights was continually widened and strengthened. Here was preponderant military influence exercised by a nation without paying the usual penalties of militarization!

What made this miracle possible? The answer is that England did not squander its resources and manpower. It did not attempt to make itself supremely strong both on land and at sea. On the contrary, it put first things first and that, in the nineteenth century, meant decisive sea power.

The vital medium of transportation, both in commerce and in war, was water. England therefore channeled the whole of its available military potential into sea power, with land strength kept to an absolute minimum for imperial policing purposes. In this way it attained a clear dominance on the seas, through a superior fleet-in-being.

This fleet in turn provided a guarantee of time for the creation of land forces if and when necessary. The mere existence of dominant British sea power, capable of striking anywhere quickly and effectively, became a species of peace insurance, a police force of global scope.

That force did not have to be gigantic in size, but simply superior to the sea power any other combination of countries could bring to bear. Every Englishman, even if he had never been to sea, was psychologically a sailor, in the sense that he grasped the significance of British sea power and as a matter of course supported his country's fleet. As Joseph Conrad put it in the opening paragraph of his story *Youth*:

This could have occurred nowhere but in England, where men and sea interpenetrate, so to speak—the sea entering into the life

of most men, and the men knowing something or everything about the sea, in the way of amusement, of travel, or of bread-winning.

The Britannic century did not end until another *naval* nation, imperialist Germany, arose to dispute British sea dominance.

Our generation, however, has witnessed the relegation of water as a medium of communication to a clearly secondary place. The seas are still important avenues of trade, although aviation is rapidly encroaching also on that function. But in *the delivery of destruction*, air has become the dominant medium. An air force commanding the "air ocean" all over this planet, because it thereby commands the entire land and water surface below, can play the same role as guarantor of peace today that was played in the past by sea force.

Therein lies America's opportunity and mankind's best hope for another long period of pacific and constructive effort. If we reduce to an absolute minimum our military investment on land and water, and concentrate our available resources, the development of an indubitably superior Air Force-in-being is within our grasp.

*American air power today can exercise a pacifying function parallel to that exercised by British sea power in the past.* We can give the human race a century of peace through air power. Not a *Pax Americana*, for times have changed, but a *Pax Democratica* in free partnership with free nations determined to make a sensibly peaceful world possible. Air power can be the guardian and guarantor of peace—until mankind, having found the wisdom to outlaw war, can safely disarm.

We can do this without impoverishing and regimenting our people, since the cost in labor and materials would be only a fraction of the cost involved in building so-called "balanced" land, sea, and air forces.

Every American would then be an airman in his heart, even if he never stepped into an airplane, in the same sense that every Englishman used to be a sailor. Every American would come to understand, to feel, that his first line of defense is in the skies. "Men and skies would interpenetrate."

The historical analogy holds true in another respect. The Air Force-



in-being to insure a *Pax Democratica* does not have to be of colossal size. It need only maintain a telltale margin of superiority, especially in quality, over the air power any anti-democratic nation or coalition of nations may have "in being," that is to say, in readiness for sustained offensive action. In the hands of a particular group of nations at the outset, this Force would tend to become increasingly the instrument of all nations, as the dream of world law came closer to fulfillment.

It might be objected that this would constitute "American imperialism." Let us not be frightened from the one sure road to peace by demagogic labels. Besides, the analogy with British sea power ends here. For purely technical, physical reasons, dominant worldwide sea power was inseparable from some sort of imperialism: to make its fleet-in-being effective everywhere, Great Britain required a worldwide network of naval bases. Its ships had to be deployed and serviced through all the seven seas. Hence it was compelled by the logic of sea power to acquire geographical outposts by conquest or diplomacy. It needed naval bastions on foreign soil and in colonial areas, thus colliding with the territorial interests of other European nations and arousing deadly resentments among colonial peoples. It had to defend those bastions locally by permanent occupation forces. In short, it had to be "imperialist" or renounce its leading naval role.

Air power, because it already enjoys intercontinental range, does not call for overseas bases and cannot be charged with responsibility for colonial enterprise. Of necessity, the democratic Air Force-in-being would operate directly from the American continent, with every important war-making target on the planet under its "guns." Modern air power can thus dispense with the imperialism that was indispensable to yesterday's sea power.

Suppose that at the conclusion of World War II the United States, Great Britain, and their democratic associates had possessed an Air Force of the kind I have sketched. The supposition is, aeronautically speaking, not at all far-fetched. Transoceanic aviation was scientifically feasible even before the war started. That it was not built and used by any of the fighting nations is a commentary on their strategic myopia, not on the aviation potential.

With command of the entire air ocean in our hands, democratic diplomacy would have prevailed over Soviet ambitions and delu-

sions. The threat of a third World War would—or at least could—have been headed off. But the Second World War was essentially a surface struggle, from which Soviet Russia emerged as the greatest surface power in modern times. There was no opposing air power of the range and size to cancel out Soviet land superiority. The lack of equilibrium swiftly provoked the actions and conditions with which the world is now grappling.

On December 7, 1941, the United States had had a golden opportunity. We lost our Navy at Pearl Harbor and were therefore starting rearmament from scratch. Had we decided at this moment to put our national resources into long-range strategic air power, we could have finished the war by *our own strength*, without reliance on allies other than Great Britain. We could have achieved victory with total air control in our keeping. We could have been in a position to enforce enduring peace not unlike Britain's position after the Congress of Vienna, when it held command of all the seas.

But our leaders, blind to the possibilities of modern air power, proceeded instead simply to rebuild their battle fleet. Their decision chained us to obsolete strategy and left the way wide open to a third World War.

Today, once more, we must make a decision as crucial as the one we evaded on Pearl Harbor day. Either we shall continue to divide our national potential three ways to support an outlived triphibious method of war-making, or we shall concentrate it boldly upon the creation of air power assuring us the right of way in the skies. This time, fortunately, American public opinion is better informed, more alert, less overawed by official and traditional views. There is, consequently, a somewhat greater likelihood of a correct choice.

If we muster the mental clarity and the psychological courage to stake our security on supreme air power, we shall assure ourselves not merely of a lot of strength but strength of the right kind—the kind that will:

1. Discourage a technologically inferior nation from precipitating war, thus serving as an effective deterrent;
2. Oblige any enemy to fight on American terms, in a medium where our natural qualitative superiority is too obvious to be questioned or ignored;



3. Have the best chance of obtaining a conclusive victory if war does come, because it neutralizes the potential enemy's land might and by-passes his chief advantage—his sheer mass;

4. Leave us after the victory in possession of the force best able to guarantee enduring peace.

I am fully aware that, in strict military logic, a policy of deterrence involves risks, particularly in relation to a country of equal national potentials. It may give that country time to forge a superior force. Theoretically, deterrence cannot be relied upon indefinitely, but only as a prelude to offensive action. That, in fact, is at the heart of the clamor in some quarters for a so-called "preventive war."

In the case of Soviet Russia, however, I am convinced that our margins of social and technological strength are so great that the policy of deterrence can be valid for the foreseeable future. If our chosen deterrent instrument is air power, no totalitarian nation will be able to challenge it. In order to create such a force—and more important, to exercise it properly—the challenger would have to possess talents which are the end-products of a free society. To acquire those talents and capacities, it would have to adopt our way of life; but if it does so, it will cease to be an antagonist and there can be no war.

## HOW RUSSIA GOT ALL THE MARBLES

## 1

SOVIET RUSSIA, sprawling from the river Elbe in Germany to the Pacific, is the dominant physical fact in this postwar period. The emergence of that country as the greatest land power in history and the only real land power on earth today is the most fateful consequence of the Second World War. It may condition international affairs for generations to come. The entire pattern of world relations revolves around this axial fact. Already it has provoked a cold war and the dread of a shooting war weighs heavily on every man's spirits.

How did this tragedy come to be? Where did Allied statesmanship blunder to find itself, after defeating one totalitarian menace, face to face with another no less menacing?

The average American is deeply mystified. He wonders how the fruits of victory were lost in the very process of winning. He stares, for example, at our humiliating position in Berlin, which seems somehow symbolic of our plight. No person in his right mind would buy a piece of real estate without assurance of a right of way to the main road. Yet our leaders accepted a four-way split of the German capital, deep inside the Soviet sphere, without providing for access and egress!

The thoughtful American is baffled by such bizarre goings on. He knows in his heart that his leaders were neither knaves nor fools; that they were neither guilty of an ideological sellout nor bamboozled by shrewd Soviet connivers. The longer he studies the picture, therefore, the more he is perplexed. Either he must accept the disaster as something unavoidable, or assume that the explanation is beyond his mental compass.

Not one of the great wartime leaders, military or civilian, has come forward to explain how and why Moscow got all the marbles. They do

not question the premise that the extraordinary concessions to the Soviets all along the line were inevitable. Their own prestige, the reputation of presidents and prime ministers who leaned on their supposed expert knowledge, demands that the premise be accepted.

Yet the mystery is easily solved once it is examined—not in terms of diplomacy but in terms of strategy. It then becomes obvious that the surrender to Soviet Russia was an act of desperation by military men who believed that only Russian manpower, transformed into a terrific fighting machine, could prevent a German-Japanese victory. The statesmen, and in particular President Roosevelt, did the best they could within the limits of that mistaken belief.

The one certainty is that *the vast empire of Soviet dominion, backed by Red surface might, is a thing of our own creation.*

Knowingly, deliberately, Moscow's democratic allies conceded this empire at Teheran and Yalta, then confirmed it in the deployment of forces on both sides of the globe in the final stages of the war. With open eyes and sinking hearts, in the utterly false conviction that they had no other way out, our military chiefs and statesmen labored to create and arm the Red colossus. They equipped him with our advanced technological knowledge; they gave him exclusive control in the Balkans, in Eastern and Central Europe, in Manchuria.

Although our forces possessed the vitality to go to Berlin and farther, we halted them at the Elbe. Indeed, we then withdrew them from that river in a wide zone—far enough westward to make Stalin a present of the great Zeiss optical and precision instrument works at Jena, the most important German V-1 and V-2 rocket laboratory and production plant in Nordhausen, and the vital underground jet plant in Kahla, to mention only a few. Since the Soviets were especially retarded in optics and precision instruments, the Jena establishment was a present of great military significance. Farther south, General Patton penetrated deep into Czechoslovakia but, reluctantly and in anger, obeyed orders to retire to westward lines.

Everywhere we surrendered to the Soviets, intact, thousands of German airplanes, including great masses of jet fighters ready for assembly, as well as research centers, rocket developments, scientific personnel, and other military treasures. American officers and men in Germany at the war's end were confused and disgusted by our

inexplicable yielding to the Russians; I know because I was there and heard them. In the Far East, we turned over to Stalin Manchuria, a perfect beachhead for the conquest of all Asia, North Korea, and mountains of Japanese matériel and industrial installations.

The Soviet empire, consolidated since the war's end by brute force, does not stop at the brinks of the Atlantic and Pacific. The Eurasian continent must be viewed as a vast air-power platform, economically self-sufficient and disposing of the labor and military manpower of at least a third of the human race. With present-day equipment, this platform threatens an area five thousand miles beyond its periphery, embracing the whole planet except South America and Australia. What matters most to us, it now brings the entire United States—the industrial arsenal of civilization—within bombing range of Soviet aircraft.

The picture is as disturbing and as potentially catastrophic as the events leading up to World War II. And our distress is deepened by a sense of guilt. We are aware of having ourselves nurtured the strength of the Soviet giant. Even as in the old legend, *our leaders built a Frankenstein monster* whose destructive power now menaces all civilization. A large part of the formidable Russian militarism is clearly marked "Made in America," and a larger part of the Soviet technological machine—the most advanced radar, proximity fuses, guided missiles, jet and rocket propulsion, atomic research—is marked "Conceived in America or in Germany."

How and why did this happen? Why were our leaders willing to risk the safety of present and future generations and to pawn the very purposes for which the war was being fought?

The answers must be found, no matter whose feelings they may hurt, as a guide to the future. The nature of the strategic blunder must be understood, so that our national security may be taken out of the keeping of the type of military thinkers who were responsible for it. The subject is too vital for diplomatic evasions.

THE CREATION of the Soviet Frankenstein monster was neither a sell-out nor a political failure. It was the inescapable product of military

backwardness, resting on ignorance of the new strategic equations of the air-power age. The clues to Allied policy will be found in strategy, of which diplomacy was simply one expression.

Our military masterminds could not comprehend the new strategic truths: that air action can weaken and neutralize armies to the point of impotence; that conquest of the air spaces over an enemy nation can by-pass and disarm its surface forces and impose surrender without the traditional showdown on battlefields. They looked upon the conflict as another war of the 1917 type. They saw only an old-style clash of millions of men in bayonet charges, a repetition of the battle of Argonne on a colossal scale. They were heartsick over the prospect of Americans dying in hand-to-hand combat in a mile-by-mile contest for territory.

Our leaders were dismayed by the overwhelming surface forces of the Axis nations. By their old-fashioned textbooks, they were certain Germany and Japan could not be defeated unless and until their armies were beaten on the field of battle. Separated from the enemy armies by thousands of miles of water, aware that in any case we could not hope to match the enemy's land might, they felt desperately in need of the Soviet bayonets. The speed with which the Germans overran Western Europe, then advanced to the Volga and the Caucasus, only confirmed their belief that the war was lost unless the Russian human potential were made effective.

And within the bounds of their 1917-vintage ideas they were right. As long as air power was held to an auxiliary role, to clear a path for armies and navies, the Germans were invincible. Hitler knew this, which is why he dared wage war in the first place. He, too, never understood strategic air power and therefore was ready to stake his dream of dominion on his magnificent surface forces.

The only way to head off defeat, according to the Marshall-King concept, was to create a land force capable of defeating the *Wehrmacht* and then Japan's armies. That meant creating and supporting a Red Army greater than all the Axis armies combined. Strategic fallacies thus made our leaders helplessly dependent on the Soviet Union, willing to gamble the future of civilization by building up a Red giant. Having fixed on a strategy they could not carry out by their own means, our planners lost political initiative and independence.

Soviet participation seemed a godsend. We need only placate the Red hierarchy and convert its manpower into a counterweight to Axis power on both sides of the globe! Simple and, in terms of life, economical. So the twenty-two months of Soviet-Nazi collaboration against the Allies were written off as an incident; the dangers of fattening up a totalitarian police-state no better than Hitler's were wished away.

Every Red division thrown against the Germans meant so many American lives spared. In arming the Russians for battle, in loading them up with our airplanes and tanks, our ships and factories, we seemed to be getting the best of a practical bargain. In effect, we were trading American capital and resources for Russian lives, and no price in political and territorial concessions seemed excessive. The deeper we could "lure" the Russians into Europe, indeed, then into Asia, the less area would remain for us to conquer in bloody bayonet contests.

Western leaders felt they were playing a shrewd game in making it worth Stalin's while to pursue the Germans as far as the Elbe, then to take on the Japanese armies. They probably believed they had "put one over" on the Kremlin by leaving the brunt of the ground struggle to the Russians.

Stalin was not outsmarting anyone. His military concepts were no less primitive than ours. Convinced that we could not finish the war by ourselves, he assumed, rightly, that he could demand any price and get it. Our military masterminds were prepared to pay any price for Russian manpower. At their end, the Soviet leaders were willing to buy territory and political power at any cost in Russian casualties.

The essence of the matter was military ignorance. We built a Frankenstein monster; we educated him; we shared with him much of our technology because our leaders were unaware of their own potential strength—of the possibility of disarming and defeating the enemy through the skies. To indicate the completeness of the black-out in high places on the whole subject of air power, let me cite an example that sounds absurd today but at the time had the ring of wisdom:

In the summer of 1940—though aviation in action had already been on view in Europe for nearly a year—Admiral King actually insisted that "*there are no objectives in the air but only on the surface of sea*



and of land, which, it must be admitted, are consequently the proper objectives of the corresponding land and sea forces."

Coming from an admiral, this sort of statement is especially revealing. After all, what was the primary objective of sea power but the enemy fleet-in-being? To Admiral King, however, the entire German *Luftwaffe* was *not* a proper military objective! Conquest of the right of way on the blue waters was a proper aim, but conquest of the right of way in the blue skies was not! But if there wasn't any proper objective in the air because people do not live in the air, then certainly there is no objective on the high seas for the same reason! Both mediums are used exclusively for transportation.

Admiral King's inability to draw the obvious parallel between sea and air power speaks volumes. The men who led us in war, though expert in orthodox surface warfare, simply had failed to keep abreast of the new facts of military life. Talking to the press in August of 1943, Admiral King stated the official strategic viewpoint as it affected policy toward Russia quite candidly:

"Boiled down to its simplest terms, and oversimplified, the grand strategy of war in Europe is that Russia has the geographical position and the manpower that are paramount in regard to Germany. In order to take advantage of that basic fact . . . we must get into Russia all the munitions we possibly can get in there to implement that manpower and exploit that position."

There we have the full explanation in capsule form. Within the limits of his fallacious conception of the situation, the statement was logical. Everything else—Teheran, Yalta, Berlin, Manchuria—followed.

Though our President technically was the Commander-in-Chief, he leaned on King, Marshall, and their colleagues in the actual formulation of strategy. Besides, his reaction to air power had always been hostile. In the prewar struggle between airmen and traditionalists he had unfailingly sided with the surface-minded faction.

The fact that Mr. Roosevelt, in the spring of 1940, overriding the objections of General Marshall and even General Arnold, ordered the construction at forced tempo of fifty thousand airplanes is often cited as proof that he early recognized the importance of air power. In truth it proved nothing of the kind.



Mr. Roosevelt's fifty thousand planes merely amounted to a belated admission that modern armies and navies need the air weapons along with their guns, tanks, torpedoes, and other standard equipment. He was not building air power but simply reinforcing our surface strength. Long-range aircraft—which could have taken us out of hock to Russian surface force—were tabooed and the rest were “behind the bulk of the Navy program, behind battleships, behind tanks, behind trucks and a host of other war items” \* on the list of armaments priorities.

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Thus the whole official strategic concept led us to the paradox of a democratic war dependent on Communist strength. In our war with Japan, which ended victoriously with millions of Nipponese troops still in the field, the fallacy of this concept was made too obvious to be denied. Let us, therefore, first look closely at that end of the struggle.

For our leaders it was axiomatic that Japan could not be beaten without defeating its surface forces. A grand showdown battle between foot soldiers in the Napoleonic manner was taken for granted. Their problem, they thought, was to conjure up armies as a counterweight to the Mikado's.

Therefore they began with a prodigious effort to arm the Chinese. Burma Road, the dramatic air transport over the “Hump,” the network of new roads, the investment of billions of dollars and precious matériel in China—these were all part of the plan to build up Chinese surface force to match Japanese surface force.

The plan failed. The Chinese, unlike the Russians, proved too backward, too disorganized, insufficiently industrialized, to provide the gigantic land strength required. Hell-bent for invasion of the Japanese home islands, the Marshalls and the Kings therefore again looked to Moscow. The Red Army would tackle the enemy forces on the mainland, while American armies did the same in Japan proper.

Fortunately, the technological genius of our country, as expressed in long-range air power—ultimately in the B-29 Superforts—made

\* New York *Herald Tribune*, February 17, 1942.

those showdown hand-to-hand struggles unnecessary. While the highest echelons planned for them, the rank and file of the American Armed Forces knew better. At a dinner given to me in Leipzig on May 18, 1945, one of our top ground generals noted the growing enlightenment of American public opinion on the subject of air power. Then he added:

"After I saw what air power did in Europe, it will be a crime if a single American soldier should lose his life in invasion of Japan. I am convinced that air power can force Japanese surrender without invasion."

But Washington proceeded stubbornly to gear for invasion. It would recognize no alternative to the sacrifice of perhaps half a million American lives for that climactic hand-to-hand struggle.

In his final report on the conduct of the war, General Marshall cited the last-minute Soviet intervention as a vital factor in the defeat of Japan. That can be generously discounted as a diplomatic gesture. Actually it is no longer a secret that Tokyo had been probing for a chance to surrender months before the U.S.S.R. dropped its neutrality. Moscow did not join *that* war until two days after the atom bombing of Hiroshima. Whatever fighting the Red Army did in China in the next few days, until the formal surrender, had not the remotest effect on the overall picture. The great gifts made to Stalin as reward for his promised help in the Far East were therefore so much waste.

As late as June 21, 1943, General Marshall explained in a speech that "your adversary may be hammered to his knees by bombing but he will recover unless the knockout blow is delivered by the Army." He has never revised or retracted this inherited idea.

Hence the staggering advance payments to the Kremlin. The Big Three forgathered in Yalta early in February, 1945. By that time American B-29's were at last in a position to carry strategic warfare to the heart of Japan. Tokyo's aerial potential had already been largely dissipated in piecemeal defense of island steppingstones. To those whose minds were not closed to the implications of this fact it was clear that we were in the final stage of the conflict; the last excuse for drawing Russia into the Pacific struggle had disappeared.

But such people were not heeded as the Yalta negotiations proceeded. Our President had been persuaded that victory in the Pa-

cific still depended on the collaboration of the Red Army. The need for a final battle on the surface seemed a sacred law.

Presumably, Mr. Roosevelt was shocked by the price—in retrospect, blackmail seems a better word for it—that Stalin demanded. He knew better than anyone else that the liberation of Manchuria from foreign control had been one of the main purposes of the Pacific struggle. To award a dominant position in that area to Soviet Russia came close to giving another country, and a police-state at that, the very thing we were fighting to keep from Japan.

But orthodox military clichés ruled our thought. Statesmen and strategists were convinced that the struggle would end on battlefields or not at all. Here, as in Europe, the vision of horrible losses in American lives made them yield to the Soviet demands. Self-consciously they hid from the Chinese Government the full measure of tribute that had been exacted. Had it not been for the atom bomb, our military men would probably have insisted on the unnecessary invasion. They could neither visualize nor stomach the idea of a surrender to air power.

Fortunately, and I think wisely, President Truman decided to unleash the atomic weapon. Our military leaders were thus provided with a face-saving alibi for dispensing with invasion. Japan, they could now pretend, had not surrendered to air power but to a new and unforeseen force. Thus perhaps a million American and Japanese lives were saved. But meanwhile, the Red giant, already fattened on the European side, was given additional stature at the Asiatic end.

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IN THE European phase, the strategic realities are not so clear or so apparent. They are beclouded by the fact that there the outlived blueprint was followed with obsessive zeal to the bitter end.

True, in the final stage it was strategic bombing of Germany's industrial vitals which sapped the strength of Hitler's armies in the field. That was what made possible the converging of Allied surface forces from East and West upon a crippled and impotent nation. Had the *Luftwaffe* not been smashed, the invasion through Normandy would have been impossible.

Hitler's fuel supply had been wrecked and exhausted, his transportation disorganized. Most important, the aviation component of his land-air team had been virtually destroyed. After V-E Day, I met some of our soldiers at the Elbe River, the farthest point of penetration. Many of them assured me they had not seen a single German plane all the way from Normandy to Magdeburg. Our air dominance was complete. That is what strategic air action against Germany accomplished.

The German armies were consequently at a terrific disadvantage. It was as if, before the advent of aviation, an army stripped of its gunfire were called upon to fight an adversary possessing deadly and devastating artillery. But since an invasion did take place, the pattern of victory was enough like the textbook description in its main features to leave wide margins of doubt about the role of air power.

The picture is further obscured because the air force in Europe was not employed to score a decision but only to soften the enemy for invasion. Though commanded by airmen, the overall air effort was in the hands of terrestrial amateurs. No thinking airman will insist that our air force potential in Europe was always used wisely.

Nevertheless, I assert that Germany could have been disarmed and defeated from the skies had we exploited our air potential rightly and to the full; that Hitler's armies could have been immobilized like the Japanese armies; *that the help of Soviet Russia would in that case have been superfluous.*

I go further: in the measure that the availability of the immense Soviet manpower for surface conflict confirmed our high command in its surface plans, it acted as a brake on the development of true air power. Thus the war was prolonged and the victory emasculated. Thus we ended the struggle without the means of enforcing a real and lasting peace.

Suppose the Soviets had remained neutral, or worse—joined Hitler. Would the American people have thrown in the sponge? Certainly not! Lacking the necessary bayonets to challenge the enemy on the fields of battle, America would have had no choice but to channel its resources into strategic air force. Grim necessity would have cracked the resistance to the air-power type of thinking.

The vast amounts of labor, materials, and ingenuity we devoted to creating and supporting Stalin's war machine would have been released to implement all-out strategic air force. The eleven billion dollars' worth of lend-lease aid funneled into Soviet surface might, and huge amounts devoted to our own surface forces, would have enabled us to double our air effort. We could have flown more than twice as much *firepower* into the German skies, and thus eliminated Hitler's aviation twice as fast. The country would have been disarmed in the air at least a year sooner.

According to official records, we dropped 1,461,864 tons of explosives which, together with the British 1,235,000 tons, demolished or impaired 80% of Germany's productive facilities. Had we been constrained from the beginning to mount an offensive through the air, instead of relying on surface offensive by Russia, we would have put our *best* available planes into production, to do the job more quickly and more thoroughly.

As against the B-17, with a carrying capacity of only three tons from the British Isles, we could have used the Douglas B-19. That plane, *already flying*, had a range of eight thousand miles and could carry ten tons of bombs—from the British Isles even more, because of the short distances—with approximately the same crew as the B-17. But it was brushed aside arbitrarily, in line with the national commitment to a bayonet contest.

Our high command not only saw no need for the larger bomber but regarded it as a waste of resources. \* That was the only point at which we turned economical. Had the general profligacy in building everything extended to bombers, the air story might have been differ-

\* The *Martin Star*, organ of the Glenn L. Martin Company, February, 1942: "Mr. Martin has already declared that the Martin Company can build a 250,000-pound flying ship, able to carry 80 tons of bombs or cargo to Europe at a speed of more than 300 miles per hour at any time that there is a demand for it." Mr. Martin, himself, in the *New York Herald Tribune*, September 27, 1942: "There is no technical limit to the size of planes. At Baltimore we have already designed a 250,000-pound flying boat, almost twice the size of the *Mars*. With such a ship we can strike across the Pacific and return with fuel to spare. . . ." T. M. Girdler, of Consolidated Aviation, in an address before the New York Chamber of Commerce, December 3, 1942, described an airplane under development which "could span the Atlantic in a few hours. . . . As a bomber [it] could make non-stop trips to Europe and return. . . ."



ent. As it was, the B-19's were not available by the time experience had taught our strategy-makers the aeronautical facts of life. With B-19's instead of B-17's, the United States Air Forces could have quadrupled their effort, dropping some 6,000,000 tons of explosive by 1944.

Consider the magnitude of our investment in surface strategy against Germany: billions for the arming of Russia; billions more for a Navy to transport, protect, and patrol the lend-lease gifts to that country. Had that wealth been made available for air power, 7,250,000 tons of Allied explosives could have been unloaded, and in a much shorter time, even with B-17's and Liberators. By that time, it should be recalled, we were in a position to maintain and supply overseas bases from which to exact a German surrender without a European invasion. Our Navy had established complete control of the seas and the German submarine menace had been eliminated. Overseas supply lines were therefore open to make effective even strategic planes of limited range.

As a matter of fact, the German people would not have allowed us to push such a destructive program to the finish. They would have surrendered long before that. What sustained their morale up to the last minute was an unshatterable faith in their *Wehrmacht*. Like ourselves, they thought only in terms of decisive land contests. As long as they possessed surface strength, they had also the hope of defeating us. Sooner or later, they thought, the Americans would attempt to storm the Continent and the *Wehrmacht* would drive them back into the Channel. Had they seen only the melancholy prospect of unceasing overhead punishment, their morale would assuredly have been shattered. It was our determination to invade, to exact surrender on the ground in the traditional style, that kept German resistance alive. Germans failed to understand that with their shield of air power smashed, our victory was merely a matter of time.

Moreover, had the war been won with strategic long-range air power, the ensuing peace would have been unambiguous. Whether in the hands of the United States or turned over to the United Nations, this force, capable of acting as a deterrent to any new aggressor, would have become the instrument for safeguarding the victory. Soviet Russia, whether as a neutral or as a belligerent restricted to its



own terrain, would not have been tempted to flex its muscles. Stalin's propaganda trumpeters would not have been able to exalt him as a "military genius" surpassing Napoleon.

There is also this to consider. If Soviet Russia had not been invited and supported to play a leading role in the conflict, it would have been cut off from the immense technological progress made by the Allies, especially by America. It would not have had access to the scientific setup, equipment, and brains of advanced German technology. In short, it would have been industrially isolated, and seriously handicapped at the war's end in any schemes for expansion and aggrandizement.

The Soviet economic system, when all is said and done, has been strictly parasitic. Its rapid industrial growth under the Five Year Plans (very much like the Japanese industrial awakening in the last century) was strictly imitative, based on imported machinery and skills. Soviet Russia has contributed nothing to the aggregate technology of the world. It has merely copied, sometimes well and sometimes crudely, the techniques developed by the capitalistic civilization it is pledged to destroy.

Today the Soviet economy and military machine have the benefit of German and Czech and Austrian talents. All the same, if technological isolation of Russia can be made effective by the non-Soviet world, Russia must quickly drop far behind in its attempt to keep up with industrial progress in the rest of the world.

ALLIED MILITARY MEN were terrified by the prospect of a separate peace with Germany that Stalin held over the heads of Roosevelt and Churchill and used to raise the price of his manpower contribution. A hint of it thrice removed was enough to touch off more panicky appeasement. But far from being a catastrophe, a separate Moscow-Berlin peace might have proved a blessing in disguise.

Assume that peace had suddenly "broken out" on the Eastern front. It would have released Nazi German manpower on land. But where could that manpower go? The *Reichswehr*, entrenched on the

Atlantic, had already reached the limits of its capacity. It was bottled up in Europe. The availability of more tanks and millions of soldiers would not have advanced in the slightest Hitler's chances of invading England, since he could not achieve control of the skies.

True, a lot of German aviation would have been released by a separate peace with the Soviets. But not enough of it could have been employed against our strategic air force to affect the outcome; it was largely of the tactical species, useful only in clearing a path for armies. Corporal Hitler understood as little about strategic air power as our own leaders. Unlike the United States, in addition, Nazi Germany did not have the benefit of a free public opinion in this matter. Hitler's archaic ideas were crammed down German throats by force and could not be altered, as happened in large measure in America once our people learned the facts.

Besides, by that time the German industrial setup was rigidly committed to *tactical* aircraft. The manpower set free by the separate peace could not have been applied to the creation of *strategic* air force quickly enough to have done any good.

At our end, the sudden elimination of the Red Army would have stopped the enormous drain on our resources in aid to Russia. That potential, if converted into strategic air force, would have enabled us to defeat Germany more surely and more swiftly than reliance on our own or Soviet ground forces. And that conversion would have been undertaken from sheer necessity; we would have had little alternative except the inadmissible one of surrender.

In sum, we were not outsmarted by Stalin; we outsmarted ourselves through ignorance of the aerial strategy at our disposal. In order to make use of Russia's teeming manpower, we pulled the stopper out of the bottle, releasing a powerful Red genie with a penchant for aggressive mischief. We paid off Moscow, in reckless disregard of the consequences to future generations, because our high command knew no alternative to land warfare.

Strategic fallacy impelled them onto the path of reckless political adventure, and for that the whole world is now paying a cruel price in piled-up armaments, fears, ideological crusades, cold war, and the continuing threat of a hot war. Intended presumably to save a few

hundred thousand American lives, their strategy now jeopardizes the lives of millions through the danger of a third World War.\*

In Europe, and subsequently in China, we invited the Communists to move in—we begged them to move in—as our answer to the Axis ground forces. The delusion that ground battle was an indispensable prelude to surrender was so deeply imbedded that General Marshall, as we have seen, felt it necessary to credit the Russians with a decisive land battle in northern China in explaining Japan's defeat. He stretched events to prove that the prescribed land contest *had* taken place. It is amusing, and disheartening, to note that Admiral Gallery in a recent magazine article still lists Russia's entry into the war among the primary reasons for Japan's defeat.†

In both major theaters of action, our military leadership was the prisoner of its own strategic astigmatism. Our Commander-in-Chief was in turn *their* prisoner. That, as I see it, is the real reason for the military political blunders, for the seeming diplomatic stupidities, which crowded the world into its present blind alley.

I may be told that this is "hindsight" (which it decidedly is not), but that's beside the point. Why Russia got all the marbles needs to be understood, not as reproof for past errors but as a warning against their repetition. The group now shaping our strategy is in essence the same as the one that led the last war; it is laboring under roughly the same intellectual handicaps. It still believes, in the words of General Omar Bradley, Army Chief of Staff, on February 4, 1949, that in another conflict "we shall once more be forced to gain the inevitable victory over our dead bodies—those of our soldiers on the ground."

This group has a strong interest in minimizing or concealing the strategic blunders which gave Soviet Russia its dangerous advantage. That, I have little doubt, explains the violent attacks just now on strategic bombing, the anxious underestimations of the role of air power. Only by discrediting air power can the strategists of the last war be shielded against the charge of backward military thinking.

Now, as then, we are largely confined to a two-dimensional field of

\* As this book goes to press, fighting has flared up in Korea, and American casualty lists are beginning to come in. Already we are paying the initial installment on political blunders flowing from strategic ignorance in World War II.

† *Saturday Evening Post*, June 25, 1949.

vision. President Truman, unlike his predecessor in the White House, is not hobbled by strong naval predilections. Nevertheless, he is dependent on military advisers who, by and large, are still "sold" on the triphibious land-sea-air task force.

Because our strategy in the last war did not reflect our unique national qualities, as expressed in aeronautical achievements and skills, the victory has proved empty. But the obsessive notion that enemy armies must be met and defeated on the field of battle on the surface of the earth still grips the minds of men in high places. Evidently they are preparing once more to deal with colossal land forces—larger and more powerful than Hitler's. Having no other solution that fits their earthbound logic, they propose to rearm the nations of Western Europe, perhaps also Japan, and to generate an American land force of fifteen to twenty million men.

As danger spots in Europe and Asia multiply, the hopeless shortage of manpower for their containment on the surface becomes more glaring. Even orthodox observers are increasingly worried on this score. But they cannot bring themselves to seek a strategic solution within our manpower limits. Instead, in a know-nothing, learn-nothing spirit, they again look anxiously for great manpower reserves in other countries. Some see the solution only in restoring the military might of Germany and Japan, hoping to fight a land war by proxy. To make up for inadequate manpower in World War II, we created a Frankenstein monster. Now, in preparing to subdue him if necessary, we are being advised to create two such monsters, again with no assurance that they will not turn against us.

Everyone recognizes that in a war our allies may be quickly overrun and made impotent. Our safety therefore lies in strategy that we can carry out by our own strength, applied from our own hemisphere.

The recklessness with which we constructed a monster that now alarms all mankind packs an urgent moral for the American people. The stakes are too high to be risked on old and discredited players with minds stuck in the outlived past. Our people must take a hand in the game, to make sure that the military leadership is suited by knowledge and experience to plan and lead in the air age.

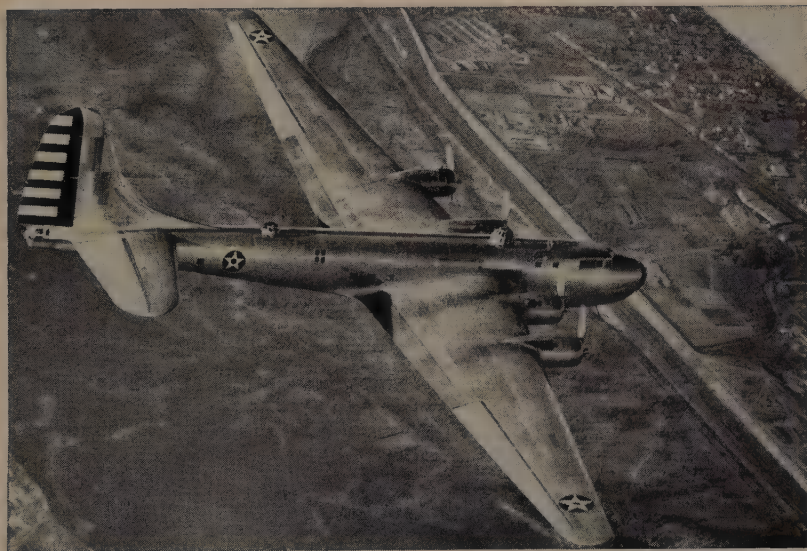




*Associated Press*

**STRATEGIC ORPHAN:** This Douglas B-19 bomber, with a flying range of almost 8,000 miles, was already flying in 1940, but was not put into production because our planners could not see the need for it. It was 30 per cent larger than the B-29. With new engines, available during the war, the gross weight of the B-19 could have been raised to 100 tons, with corresponding increase in range, bomb load and fire power.

**B-19 IN FLIGHT, 1941:** This plane could have delivered 18 tons of bombs from the British Isles to Germany, compared with the 3-ton bomb load of the Flying Fortress, which was arbitrarily selected as the backbone of our strategic air force. In Europe, this sixfold bombing power could have brought victory without invasion. In the Pacific, it could have destroyed Japan directly from Alaska and China, sparing us the costly island-to-island approach.



*Press Association, Inc.*



*USAF Air Materiel Command photo*

**TRUE WEAPON OF INTERHEMISPHERIC AIR WARFARE:** The 180-ton B-36 dwarfs the 70-ton B-29, largest aircraft used in World War II. The B-36 can strike an enemy directly from the American continent; the B-29, and even its improved version, the B-50, are both dependent on overseas bases—and hence on huge land and sea forces.



## HISTORY REPEATS ITSELF



B-19: This is the plane we could have put into production—

*Wing Span—212 ft.*

*Length—132 ft.*

*Gross Weight—82 tons*

*Range—7,750 mi.*

*Bomb Capacity—18 tons*

*Horse Power—8,800 (with engines available during war, 12,000 hp.)*



B-17: But this is the one we did put into production.

*Wing Span—103 ft. 9 in.*

*Length—73 ft.*

*Gross Weight—30 tons*

*Range—2,500 mi.*

*Bomb Capacity—3 tons*

*Horse Power—4,800*



B-36: We are acquiring a limited number of this plane—to equip four Groups.

*Wing Span—230 ft.*

*Length—162 ft.*

*Gross Weight—180 tons*

*Range—10,000 mi. plus*

*Bomb Capacity—36 tons*

*Horse Power—18,000 plus 4 jets*



B-50: While producing this one in quantity—to equip at least twenty Groups.

*Wing Span—141.4 ft.*

*Length—99 ft.*

*Gross Weight—80 tons*

*Range—5,000 mi.*

*Bomb Capacity—10 tons*

*Horse Power—12,000*

Despite its superior performance, the B-19 was not selected to fight World War II because it did not fit into strategy based on the experience of World War I. B-36 production is confined to a limited scale in preparing for World War III because its role is restricted in the current strategy based on the experience of World War II. Again we are preparing for the next war with the obsolete methods and weapons of the last war.

## OUR OWN MAGINOT LINE

## 1

VICTORY, no less than defeat, has its perils. It acts as a mental soporific. It promotes undue self-confidence. Most dangerous of all, winning nations tend to glorify the methods and the weapons that brought them victory.

Temporary expedients, even the makeshifts forced on a country by faulty planning and strategic miscalculations, having been crowned by success notwithstanding, are likely to be raised to the rank of eternal military principles. Victories due to enemy weakness or blunders are likely to be credited to our own brilliance.

Anyone who dares question the wisdom of the conduct of a victorious war—or dares deny that its procedures must remain valid for the foreseeable future—seems an arrogant ingrate deficient in the vitamins of patriotism. After Goliath was vanquished, we may suppose, the slingshot enjoyed great prestige as an instrument of national security.

Consider France at the end of World War I. It had won in the trenches. Flushed with that victory, it had a surpassing faith in trench warfare. Blind to crowding changes and deaf to doubts, it proceeded to construct a supercolossal de luxe trench—the Maginot Line—and thereafter luxuriated in its feeling of safety.

As an engineering job the Maginot structure was superb. It embodied the latest and best scientific gadgets for efficiency, comfort, and good housekeeping—automatic elevators, air conditioning, refrigeration, intercommunication systems, the most advanced artillery. In short, it took fullest advantage of scientific progress in weapons between the two wars. But it was still a trench: a steel-and-concrete monument to the tragic assumption that any new conflict would be as static as the last one.

True, there was a young officer named Charles de Gaulle who disputed that assumption and warned against the danger of smugness. He talked of mobile and motorized warfare spearheaded by aviation. Many others had serious misgivings about the survival of France if it relied largely on a fixed defensive system.

But France refused to listen. Its delusions of security were fortified by such newly haloed heroes as Foch, Joffre, Pétain, Gamelin. To question the military omniscience of these architects of victory seemed not only presumptuous and ungrateful but almost treasonable.

Defeated Germany, by contrast, was under no such psychic handicaps. Beaten in the trenches, it was quite open to heretical views on the permanence of trench warfare. Unable, at least in the first fifteen years, to outbuild its conquerors, the country was driven to outthink them. With the orthodox weapons and methods blocked by the Versailles Treaty, Germany reached out for new, unorthodox substitutes with an open mind.

In the test of history the Maginot Line became a symbol of futility and self-delusion. But we need not suppose that the full implications of that symbol have been grasped, especially in the United States. The proof of this is that we are at this very moment perpetrating a blunder of the same order, and for the same reasons.

Having won the last war with "task forces," with triphibious Army-Navy-Air teams, we are proceeding to build supercolossal de luxe task forces and carrying the team principle to the extreme of absurdity. The central assumption of our strategic planning is that on the whole the next war will be fought along the lines of the last one.

In America today, as in France a generation ago, public opinion and lawmakers are overawed by the prestige of five-star generals and admirals who have just delivered victory. They seem most fitted to guide our preparations for any future conflict. Even in the conduct of non-military aspects of national affairs and international policy, their opinions glow with the radiance of recent glory. To suggest that certain campaigns, not to mention the war as a whole, may have been won despite some of the leaders would come close to sacrilege.

The methods and weapons which defeated the Axis enjoy an emotional priority in our thinking, a special lien on our loyalty. They

worked, didn't they? To criticize them, therefore, seems churlish if not downright unpatriotic. Not many analysts of the last war, or writers about the next, in any event, venture to dispute the essential rightness of the land-sea-air combination of "balanced forces."

As in the case of the Maginot Line, these task forces will, of course, embody the latest technological innovations. Little gliders are being displaced by power gliders, tanks by supertanks. Assault barges firing primitive rockets are being replaced by superbarges—modified battle-ships firing guided missiles. Escort carriers, the Navy insists, should be supplanted by gigantic floating islands at half a billion dollars a throw.

But all this is magnification, not change.

The concepts of war-making with which we expect to achieve victory in any new war are the same as those first revealed to us by the Germans and the Japanese in the last war. If we are not shocked into awareness of this error—this intellectual inertia—the price we may have to pay can be truly tragic.

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IN HISTORIC PERSPECTIVE the methods of World War II will appear as a highly transitory and almost accidental stage between the surface conflict of the past and the aerial warfare which canceled it out. It will be clear, moreover, that the transition procedures improvised by all belligerents were not inevitable but the results of strategic astigmatism in high places. In every country there were those who saw clearly the possibilities of the new, emerging strategy based on air power. But they were for the most part on the sidelines.

Technologically, the weapons of pure air strategy were possible and feasible before World War II. The B-19, with its 8,000-mile range, as already noted, was not a romantic fantasy but a flying fact, needing only to be endowed with the proper military characteristics for combat from bases already in our possession. Planes of even longer reach were on the drawing boards. No new inventions were needed to put into the air the ocean-spanning craft which emerged with the end of the war.

Such planes were not built and not used only because the military

monitors of all fighting nations had not caught up with them mentally and psychologically. Their eyes were glued to the surface of the earth and aircraft figured in their calculations only as accessories for armies and navies.

The airplane in fact had already stripped land and sea forces of their traditional roles. The battleship was no longer mistress of the seas, since it could not function in waters policed by enemy aviation. Armies were helpless under hostile skies. This truth, however, was not immediately perceived except by a few here and there who could be laughed off as "extremists." There was the familiar time-lag between the advent of new weapons and the mental acceptance of their tactical use which Admiral Mahan had noted in his day in other contexts.

Discovering that their old principles were not working smoothly as in the past, bewildered by the collapse of their lifelong assumptions, our strategists began to imitate and to improvise in panic. In Europe they copied the ground-air team used by the Germans. In the Pacific they copied the triphibious team introduced by the Japanese.

The tragic irony of it is that the original concept of utilizing air force of limited range to carry war to an enemy from island to island was developed and expounded by our own General Billy Mitchell. Back in 1925, in his book *Winged Defense*, he wrote: "In the future, campaigns across the seas will be carried on from land base to land base under the protection of aircraft." \* Did we listen to him? No, we court-martialed him and threw him out of the Army. But apparently Japan took his teachings seriously, to our humiliation.

With American industrial ingenuity at their disposal, our leaders soon deployed bigger and better teams in both theaters of action. In contempt of a fundamental principle of war-making, we began to build anything and everything that came to mind: the biggest land, sea, and air forces indiscriminately, to support a multiplicity of strategies, implemented by a profusion of weapons and ever-shifting tactics. Our arsenals became a kind of military department store, the shelves loaded with every conceivable variety of weapon for any emergency. A substantial portion of the goods on those shelves proved irrelevant and was never employed.

\* G. P. Putnam's Sons, page xvi.

In the end we won, slowly, expensively—not because we had the right strategy but because our foes were industrially weaker and could not sustain a prolonged contest of attrition. Happily our combined resources and manpower, as compared with those of the Axis bloc, seemed inexhaustible, so that victory came before bankruptcy.

*The entire strategy of World War II was conditioned by the lack of range in air power.* Aircraft had the destructive force to knock out an enemy country's war-making capacity. But they were not provided with the "reach" to deliver knockout blows. Consequently, they had to be carried closer and closer to the main targets in the Axis homelands by Army-Navy teams.

The bloodiest battles of the war were fought, in the final analysis, always for the same purpose: *to advance the bomber line.* We paid heavily in life and treasure for the range that could have been built into airplanes but was not.

The B-17 had to be brought to North Africa and England before it could be hurled against key enemy targets. In the Pacific, where distances were much greater, the B-29 was ultimately thrown into the breach. But even the B-29 had to be carried by task forces to the Marianas, within 1,800 miles of Japanese industrial centers, before it could fulfill its principal purpose.

Now suppose that the B-29's had been endowed with somewhat longer striking radius—say, equal to its predecessor, the B-19. The decisive attack could then have been mounted from the Philippines, eliminating the long and costly struggle for the in-between islands. Suppose, to carry the logic a step further, we had equipped the B-19 with the new engines available during the war, giving them a striking radius of 3,500 miles. In that case, the telling attack could have been carried on from Alaska. Most of the heroic struggles for Pacific islands were thus the direct results of inadequate range.

Indeed, as the range of available aircraft was expanded, the Pacific "steps" could be lengthened to that extent, by-passing islands where the enemy was entrenched. Many such islands, it should be recalled, remained in Japanese hands long after the surrender; a few of them did not even know the war was over. And every Guadalcanal "skipped" meant so many more American lives spared.

In the final stage, our Superforts were planted within striking dis-



tance of Japan proper. At last they could undertake the systematic demolition of the enemy's industrial heart independently of their teammates. In other words, the triphibious team lost its function just as soon as air power was in a position to attack the decisive targets directly. The contest for intermediary steppingstone bases represented gigantic investments in raw materials, manpower, and productive capacity. A fraction of this cost, if diverted to long-range strategic aviation designed to by-pass those in-between bases, would have achieved the same ultimate result.

The Superforts finished the job—and this is the key to an understanding of events—with millionfold Nipponese armies still intact but strategically impotent. They finished the job with a fantastic mass of American land and sea forces, readied at colossal cost for a textbook type of invasion of Japan, likewise intact and useless.

It was not the kind of finish our top leadership had visualized or, for that matter, wanted. In January, 1944, Admiral King disclosed that "a vast landing craft construction program," costing over five billion dollars, had been launched. Only recently the "disappearance" of two billion dollars' worth of invasion matériel stockpiled in the Philippines called attention to the extent of the preparations. As late as February 16, 1944, General MacArthur told the press: "We must defeat Japan's Army, and for that purpose our strategy must devise ways and means to bring ground forces into contact with his at decisive points."

But we did not need to bring our divisions into contact with the Mikado's. The vast armada of landing craft and supporting naval force was never used. The fact that the architects of our strategy spent so many billions of dollars on preparations that proved irrelevant suggests how easily national effort can be misdirected by mistaken strategic judgment, to the point of military suicide through economic exhaustion. We got away with colossal waste this time. That, however, does not mean that we can get away with it in a future test, against a stronger, richer nation.

What if our economic potential and that of Japan had been more evenly matched? The large chunk of our country's total resources sunk into useless preparations might have spelled the difference between victory and defeat. What if Japan had possessed enough air force to deny us the skies over its home islands? The five billions put

into landing barges instead of air power might have made that condition permanent. And the barges, ironically, would have been useless anyhow, since invasion without superiority overhead is out of the question.

Most intelligent civilians could grasp the obvious lesson of Japan's surrender to air power. But top-shelf surface strategists lack the open minds of civilians. Having devoted their lives to and staked their reputations on older theories, they are normally immune to the obvious. The fanaticism with which the Navy clung to battleships, ordering new ones even after the end of the war, is a case in point. Any layman could have apprised our admirals that those orders would have to be canceled, as indeed they were canceled after some \$200,000,000 had been squandered. The naval experts needed years of cogitation and soul-searching before they caught up with the man in the street on this point.

The land-sea-air team was an improvisation imposed upon us by failure to provide air power with the necessary range for direct operations from bases already in our possession. A surgeon caught in an emergency without proper instruments will use a kitchen knife and, given luck and pluck, will operate successfully. That hardly makes kitchen knives more effective than scalpels.

Caught without proper air power, our military surgeons rightly imitated and improved the makeshift triphibious team for seizing advanced bases. With few exceptions our leaders emerged from the war sold to the hilt on the temporary and accidental elements in their experience: the land-sea-air team for securing intermediary bases. So obsessive has the team idea become that they treat it as an end in itself rather than a means to an end. But they remained blind to the permanent element—the preview of tomorrow's strategy—disclosed by the aerial defeat of Japan without an orthodox showdown between foot soldiers on a battlefield.

Secretary of Defense Louis Johnson, reflecting the views of the military men around him, declared on June 21, 1949: "Though air power has given promise of speedier end to conflict, it has not supplanted the soldier who must finally defeat the enemy land forces. For ultimately war between nations is reduced to one man defending his land while another attempts to invade it."

This assertion hardly squares with the "invasion" of Japan by General MacArthur and his staff—the triumphant entry of a handful of men, without combat, into an enemy land filled with millions of well-equipped soldiers. But because it describes accurately the conditions in the past, it is assumed to hold true eternally.

In the science of war-making it is an accepted principle that when strategy is changed the leadership, too, has to be changed. A military mind steeped in old concepts can never quite free itself from their grips. There should, in all conscience, be at least an unwritten law that forbids the leaders of a victorious war to meddle with plans for future conflicts. Their natural fixation on the immediate past usually disqualifies them for audacious, imaginative planning for the coming struggles. In addition, their well-earned prestige adds a fictitious weight to their views which prejudices the chances of a clear-headed appraisal of new factors by public opinion and in legislative halls.

This is true whether it is a Foch or Gamelin urging a Maginot Line—or American five-star generals prescribing "balanced forces" for the conquest of outer bases in the World War II manner.

Instead of exalting the weapons and methods of the last war, we had better recognize that they were foisted upon us by temporary conditions; by the lack of necessary aviation range. Had the Superforts thrown into battle at the end of the war been on hand at the start, as they could have been, most of the grim contests for Pacific islands would have been unnecessary. Japan might not even have dared launch its war on the U.S.A., knowing that we could hit the very center of its war-making complex directly from bases like Burma, the Philippines, and Alaska.

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THE DOMINANT current conception of security through a balanced force operating from a chain of bases means only one thing: *an effort to perpetuate the methods and the weapons of the last war*. It is our own Maginot Line.

I have before me a batch of enthusiastic articles seeking to "sell" the official program to the American people. All of them talk about the "new" strategy and ingenious innovations. But in the end they

describe a slightly refurbished version of World War II. The suppositious novelties are in the improved weapons rather than in the fundamental strategy.

Here is the essence of their forecast: Great West European and American land forces equipped with tactical aviation will try to stem the tide of the Red Army on the Elbe or on the Rhine. A ring of bases around the Eurasian continent will be in part prepared in advance, in part conquered by land-sea-air teams at the outbreak of war. Thus our present bombardment aircraft—still overwhelmingly of the B-29 and B-50 types, which is to say of a 2,000-mile striking radius—will be put into position to hammer at the strategic vitals of the enemy.

Meanwhile a mighty Navy cruising under an umbrella of its own air power will keep the sea lanes open for a continuous flow of supplies to the far-flung network of bases. When the enemy has been sufficiently "softened," ground forces will move in for the kill, fighting every inch of the way against the opposing armies.

But what would happen if the Red tide of three hundred or five hundred divisions refuses to be dammed on the Rhine by the hoped-for forty-five Allied divisions and overflows to the Atlantic? What if those outlying bases, dependent on long supply lines but open to massed attack by the whole opposing air power from its home bases, should be obliterated? Such disquieting questions are rarely asked and never answered in the officially inspired articles.

I submit that there is nothing new in this picture projected from Washington. Indeed, insofar as it ignores the defeat of Japan without a major land battle or invasion, it is a long step backward from the experience of the last war.

Intellectually, the current strategy is at the stage where World War II *began*. We are witnessing the Maginot Line mentality at work, imposing the American equivalent of the supertrench upon the country.

The proposed use of improved weapons and explosives—atom bombs, jet propulsion, rockets, guided missiles, etc.—changes the tactics, not the strategy. The enhanced weapons are as secondary as the fact that the Maginot Line was technically more efficient than a World War I trench. We are still involved in a division of national effort to provide the largest armies, navies, and air forces at the same time—with minimal reference to their real functions. The kind of con-

servatism that denied priority to bombers as late as 1942 still prevails.

This fact, indeed, was dramatized and publicized in the last months of 1949 and the early months of 1950 in a series of amphibious, air-borne, and carrier maneuvers from Alaska to Hawaii, from Newfoundland to Puerto Rico. Those war games were all spectacular and awe-inspiring. The legislators, Cabinet members, and industrialists present, along with reporters and analysts, were of course deeply impressed by the teamwork, precision, timing, and technological marvels on display.

But there was one minor flaw in the picture of preparedness unfolded: the maneuvers might apply to a punitive expedition against some backward area, but they had nothing to do with the major strategy of any coming war. They all demonstrated operations which, under the new conditions, cannot take place until command of the entire air has been won—until the crucial decision of modern war-making has already been scored.

The war games simply skipped the prelude which, as we shall see, has become indispensable and must absorb our major wealth and energies. What they carried out were essentially follow-up actions, assuming and exploiting the victory in the skies already attained. In effect Exercises Portrex, Sweetbriar, Argentia, etc., were polishing up procedures that are of a secondary nature or entirely unrelated to the realities of tomorrow's military equation. And after every show came the demands for more appropriations by each of the participating services. At air-borne war games in North Carolina (Exercise Swarmer), for instance, Major General James M. Gavin urged a four-fold increase in troop carriers. Such additional funds, however, usually can come only from the total that should be channeled into decisive air force, so that the whole performance amounted to putting the cart before the horse.

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THE COUNTRY has listened to strangely impassioned attacks on the B-36, in particular by spokesmen of the Navy. A few critics went as far as ascribing sordid personal motives to those who ordered this plane at the expense of aircraft of shorter range. This strong feel-



ing against the long-range craft, I have no hesitancy in stating, is at bottom a reaction against any equipment that reduces the need for distant bases—and thereby automatically cuts down the strategic importance of the Army and Navy.

The projected 70-group Air Force authorized in 1948, and scheduled at the time for completion in 1952, was built around twenty groups of medium bombers of the B-29 and B-50 variety, with about a 2,000-mile striking radius. It provided only four groups of long-range B-36 bombers. Yet the B-36 has a striking range of 5,000 miles, enough to blast any target in Eurasia from our mainland without benefit of outlying bases.

It was no secret in Washington that many of the top airmen were unhappy over this program. They knew that air power must be allowed to attain its natural limits of operation in the interests of economical and invincible American strength. Only political expediency—the need to appease the surface services—explained that compromise.

With the passing from the scene of some of the men who negotiated the compromise, and the development of a better-informed public opinion, Air Force leaders were emboldened to move away from the arrangement. They began to put the emphasis on the longest-range strategic aircraft. This is the essence of the struggle around the B-36. Under the recriminations is the vital clash of strategic ideas.

Why the anxiety to hold our security pattern within the limits of a 2,000-mile strategy? The answer is to be found in the fact that this strategy is useless without an array of overseas bases. Bases in turn call for immense land and sea strength to conquer, hold, and supply them. The total military scheme thus remains unchanged. Whether we have seventy groups or seven hundred, the complex setup on the surface remains indispensable. The more air power of this limited range, indeed, the larger the land and sea forces required to make them operative.

Both the Army and the Navy are thus given a new lease on their ancient functions. They are guaranteed an equal place on the vaunted team. Meanwhile the Air Force is paid off with a formal independence that leaves it helplessly tied to the surface forces. As long as it cannot wage war to a decision by its own means from our own continent,



strategic aviation has to be carried piggy-back by the elder services within striking reach of the ultimate targets.

I am not implying a sinister conspiracy to chain us to a Maginot Line. What is involved is a limitation of strategic vision in high places. Planners steeped in old-style surface warfare simply cannot bring themselves to extend the bombing range of air power to the point where overseas bases would be invalidated and surface forces thereby left to the terrors of technological unemployment. They are halted by their honest fears of the unknown and untried.

The crux of my argument is that we shall be condemned to a Maginot Line strategy, to the unthinking acceptance of World War II methods, as long as the American people entrust the solution of military problems to strategists of the old school. The possibilities opened up by today's air power will remain largely frozen assets until those who understand them are given the right of way in formulating our security plans.

Before the last war we possessed the B-19, an 82-ton aircraft with a striking radius of some 3,500 miles. Did we put it into production to fight the war? Not at all! We produced instead 20-ton aircraft with a radius of about 1,000 miles. Earthbound military thinkers argued that armies and navies will always provide bases within that distance and hence there was no point in building planes of longer reach. The fact that it would cost vastly more to provide bases than to provide range did not enter their calculation.

Today we possess a few bombers of 150 tons with a potential radius of 5,000 miles. The Air Force is going ahead with building some of them, in the face of outraged opposition. What do the opponents prefer to have them build? Eighty-ton bombers with a striking radius of about 2,000 miles—and even bombers of smaller range carried to the scene of action on “floating bases.” The arguments advanced for holding back on the “extreme” models are about the same as those we heard when the B-19 was considered “extreme.” Our surface forces, it is argued, can be big and strong enough to make distant bases available for the smaller aircraft, so why bother with the larger ones?

I challenge any restriction on range that ties our air power and therefore our overall strategy to outlying bases. Even if a war were to begin from overseas bases—as it must were war to break out to—

morrow—it would be transformed into an all-out contest for control of the air ocean before a decision could be scored. It must fulfill the logic of modern air power, and that means an Air Force-in-being with enough range and firepower to assume control of the air space over the enemy nation and to strike at his solar plexus directly from its own continent.

Under the life-and-death pressures of a struggle for survival, the obsessions of military minds will crumble and the full technical potential of modern aeronautics will be exploited. America's Maginot Line—the concept of “balanced forces”—is doomed to failure.

Back in 1942, when airmen urged direct attack on Japan from Alaska on our own continent with aircraft whose prototypes were already in the air, the plausibility of the proposal was not denied. But we were chided for trying to win *this* war with weapons of the *next*. Well, World War II is history. And now we are preparing to fight the *next* war with the weapons of the *previous* war.

If we are to make America invincible in terms of the primary force of this epoch, air power, we must lose no time in breaking down this Maginot Line fixation in the places of political authority. We must begin now to design and build, under conditions of peace, what we shall be forced to design and build in any case under the duress of war.

To comprehend the futility of World War II methods in the setting of any new war, we must consider the whole problem of bases. Are they needed today? Can they be maintained and defended under the conditions of expanded air range?

## OVERSEAS BASES ARE UNTENABLE

## 1

WE HAVE SEEN that air power which falls short of an intercontinental range of operation is relevant only to a continuation of the strategy of the last war. The mere increase in number of planes changes nothing. No matter how large, such air power is immobilized until the Army and the Navy provide the necessary outlying bases. More important, it cannot sustain action for a decision unless those bases are continually held and defended and supplied. Air power planted on outlying bases is only as effective as the supply lines by which it is fed.

The natural question is why, having won one war by operations from overseas bases, can we not count securely on this familiar method to win another when it comes? To answer it, we must note the conditions that prevailed during World War II, and how they have altered in the intervening years.

In *Victory Through Air Power*, written in 1941, I set down a fundamental principle in the use of aerial force: "*The striking range of air power must be equal to the maximum dimensions of the theater of operations.*"

That principle was ignored and violated by all the belligerents. Although it was technically within their grasp, not one of the warring nations provided aircraft of the necessary range. That, and that only, explains why triphibious war could still be fought and, indeed, *had* to be fought.

The fact that air power could cover only a part of any given theater of action made it necessary and possible to establish and maintain *local air superiority* from time to time. Under such a local overhead cover, a battle or a base could be won. From that foothold the cover could then be extended farther to conquer yet another advance post

—in a series of jumps aiming to bring bombing power ultimately within direct reach of the main targets.

“First of all you must win the battle of the air,” General Montgomery said succinctly at the end of 1943. “That must come before you start a single land or sea engagement. If you examine the conduct of my campaigns, you’ll find we never fought a land battle until the air battle was won.” \*

He was referring to limited air engagements for control of a specific segment of sky. Obviously he could not have captured this local control had the enemy possessed effective air power with enough range to be independent of local bases requiring continuous supply reinforcements. General Montgomery’s problem was merely to defeat that fraction of German aerial force which happened to be operative over a particular battle area on land or sea. He was not called upon to tackle the major strength of the *Luftwaffe*.

Our invasion of North Africa succeeded because the Germans did not have a strategic aerial force with the range to prevent our disembarkation on the African shore. The *Luftwaffe* could not dispute our mastery of the air over the limited invasion region.

By the time we landed in Italy, the *Luftwaffe* had been too seriously weakened by our strategic action from England to present a real challenge in the skies. And by the time we invaded France through Normandy, our air superiority was for all practical purposes total.

In the Pacific the picture was not much different. We were able to destroy the Japanese aerial strongholds on various atolls simply because the main enemy air strength did not have the range to come to the rescue. At no time in the years of struggle were we confronted with the total, or even the major, Japanese aviation strength. Seen from the air-power angle, Tokyo’s strategy was as erroneous as our own and even more seriously handicapped by inadequate aerial range.

The Mikado’s high command, luckily for us, chose to defend an array of islands farthest removed from the homeland, each of them at the end of long supply lines and far removed from aerial reinforcement in time of danger. Upon each of these distant and isolated outposts was planted a small fragment of the Japanese air potential for local defense. The enemy hoped to block our progress toward

\* United Press, December 27, 1943.

Japan with this cordon of armed islands under their own fragile air umbrellas.

That defensive chain of air power, necessarily spread thin, was no stronger than its weakest link. We were able to throw concentrated force against one island after another. We picked them off piecemeal, thus not only advancing our bomber line toward Japan proper but chewing up the enemy air potential as we went along. The Japanese strategy played into our hands. The Mikado's air forces, formidable in the aggregate at the outset, were fragmented and squandered, leaving the skies over main targets on the home islands virtually undefended in the hour of showdown.

By the time American strategic air force was brought within striking reach of Japan itself, the enemy was so weak in the air that even our Navy was able to approach the country—something it could never do in Europe.

Our entire campaign in the Pacific amounted to a series of isolated battles for limited areas. This would have been inconceivable had the enemy employed strong air forces covering that entire theater of operations. The dimensions of each of the battle areas were fixed by the striking range of the aerial forces involved. In every case the result was conditioned by the contest for local control of the air.

Such local dominance might be described as "military isolationism." Just as political isolationism was possible for America in the days of inadequate range of communication and transportation, so local air control was possible only in the days of limited aviation range. But today a 5,000-mile striking radius is a reality and global range is being quickly forged. Local control anywhere within an enemy's sphere of aerial superiority has become a thing of the past.

In the epoch of sea power it would have been folly to try to establish command of a patch of ocean in the face of a superior fleet-in-being. In this aerial age it will be folly no less to try to maintain control of a patch of air in the face of a hostile air fleet-in-being.

The attempt to maintain control of an isolated piece of ocean would immediately have provoked a sea battle to a conclusion. Mastery of the seas meant *all* the seas. The analogy holds true for the air ocean. Any attempt to conquer a small part of it—to protect a base underneath or for some other purpose—will rapidly resolve into a show-

down battle for dominance in the air. Because of the enlarged ranges, mastery of the skies has come to mean *all* the skies.

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WITH local air dominance ruled out, strategy resting on outlying bases closer to the enemy continent than to our own is likewise ruled out. It is outmoded by technological progress and is headed for catastrophe almost by definition.

Consider this equation in its most elementary form. Suppose that Soviet Russia possessed powerful air bases close to the American mainland, in Cuba and Greenland, for instance. It is perfectly obvious that we could kill them off immediately after the start of hostilities by hurling against them the full weight of our American bombing power.

In such a contest American advantages would be overwhelming. We would be fighting from the source and center of our strength and supplies; the enemy would be dependent on thousands of miles of vulnerable supply lines. We could maneuver our whole Air Force-in-being for conclusive results; the enemy could use only the segment of air force planted on the far-off base. Not only our strategic air power but much of our tactical air force could be thrown into the scales. Even if we did not wish to use these bases ourselves, we could quickly make them untenable for our adversary.

A European or Asiatic nation would therefore be ill-advised to try to conquer and hold an air base in Cuba or Greenland or anywhere else within striking radius of the American continental air force. It could hope to protect such a base only by endowing it permanently with air power equal to everything we could bring to bear, plus enormous supply lines to keep them operative. Clearly this would amount to a futile and fantastic undertaking.

But why is the picture any less fantastic in reverse, when we propose to conquer and hold bases on the periphery of the Eurasian continent?

Our projected air outposts in North Africa, Europe, the Near East, the Far East, are within direct striking reach of the entire Soviet Air Force-in-being, and open in some cases to attack by millionfold Red troops as well. In a fight for those bases, the overwhelming advantages





### AIR ATTACK: DIRECT OR VIA OVERSEAS BASES?

(A) The objective—destruction of the industrial heart of the enemy nation.

(B) Array of overseas bases—which must be won and defended by ground forces, and supplied by sea forces across thousands of miles of ocean routes (broken lines), under constant attack by enemy air and submarines.

(C) The home base—from which war through the air can be carried directly, by-passing overseas bases and supply lines. This elimination of distant bases and ground and sea forces will enable us to provide superior air force for direct intercontinental offensive.

would be on the side of the belligerent operating from his home grounds. We could hope to maintain such bases only by providing *each of them* with a continuous shield of air power capable of withstanding the entire hostile striking air potential; by providing, in effect, a multiplicity of air forces, every one of them large enough to match the entire Soviet Air Force. Merely to state the facts is to disclose the hopelessness of the effort.

Look, for example, at the Near East. We are investing billions and diplomacy lavishly in that region under the delusion that it will serve as a strategic foothold and a source of oil. But this area happens to be next door to Russia, which can concentrate against it not only its long-range aircraft but swarms of its tactical aviation, as well as ground forces. Our chances of holding the Near East are in consequence about as good as would be Russia's chances of holding bases and oil fields in Mexico or Central America.

Could we perhaps defend that region with air power operating from near-by Turkey? Such an effort would be no more realistic than an equivalent attempt by Russia to support a Mexican foothold from Guatemala or Venezuela. Turkey does not have the industrial background to support a great modern air fleet. We would have to endow that country with air force not merely equal to all of Russia's but—to make up for the handicap of distant sources of supply—far superior.

And this is equally true of Libya, Greece, and other bases within striking distance of an enemy's major air potential. We dare not gloss over the decisive fact that a chain of air bases around an enemy continent implies a chain of air-power units, *each* of which can "take on" everything the continental adversary can throw at us—all this in addition to the colossal armies and navies required to conquer and supply them. It implies a strategy so profligate that we would need a population as large as that of the entire Asiatic land mass, and resources many times larger, to make it stick.

*Outlying bases intended for decisive action should be so located that any air attack against them will involve for the attacker the risk of joining in a major air battle to be fought to a conclusion.*

Even the richest country on earth cannot physically provide more than *one* major air potential—and that means on its own continent, close to its industrial centers and freed from dependence on long and

vulnerable supply lines. To attempt to duplicate that potential, let alone multiply it in terms of a global network, is beyond the means of any nation.

Temporary control of outer bases for one-shot action of the hit-and-run kind is still possible. In surprise assaults on a sleeping foe a baseball bat may be as effective as a machine gun. Much of the current strategic thinking, alas, revolves around such initial surprise attacks, in the far-fetched hope that they will stun the enemy beyond recovery and end the conflict before it is really started.

But permanent control of distant bases for sustained strategic offensive aiming at a decision is the stuff of surface-minded dreams. The limitations of range that made this possible in the last war have been burst wide open. Distant bases will be either captured or demolished from the word go. A stalemate will ensue. A decision will be postponed until we are ready to use long-range strategic aviation that rises from our own mainland, destroys the target on the enemy continent, and returns to its home base. Unless the enemy is ready with that kind of air power first. . . .

Advance bases, it seems clear to me, will be ruled out—except for possible use for initial surprise assault. And if the initial attacks fall short of victory, those bases will have to be hastily abandoned. The manpower, wealth, and diplomacy put into them will be a total loss. Like it or not, prepared for it or not, we shall then be obliged to undertake a strategy for the conquest of the air ocean. Only after we have defeated the opposing air power and thus attained the right of way through the skies will we be in a position to destroy the enemy war-making strength in his homeland.

IN a lecture on "Air Superiority," in 1947, the able British airman Lord Tedder made the following assertion:

"The fight for air superiority is not a straightforward issue like a naval battle or a land battle; it is not even a series of combats between fighters; it is frequently a highly complex operation which may involve any or all types of aircraft. It is a campaign rather than a battle, and there is no absolute finality to it so long as any aircraft are operat-

ing. It may be very local and temporary—i.e., covering a specific operation—or it may be widespread and sustained as it was in the final phase of the war in Europe.”

Which may serve as evidence that even airmen may overlook the significance of the new facts of interhemispheric range. Lord Tedder’s statement describes accurately the conditions under which air power worked in the last war, when it fought under the handicap of insufficient range. He describes the situation when “temporary empires” of distant bases close to the enemy heartland were still conceivable.

With the development of intercontinental, interhemispheric, and ultimately global ranges, that summation has to be revised. Under the new conditions, the fight for air superiority at any vital point *will* resolve into a “straightforward issue” like a great naval or land battle in the past.

I agree that the battle may be so complex that it will assume the proportions of a “campaign”—but it will be a campaign that will determine the outcome with “absolute finality.” As a matter of fact, the next war will amount to a campaign in the air; it will be started, fought, and finished in the air, with the victory in that medium conclusive. It will no longer be possible to shield a specific surface operation if the enemy is determined and equipped to dispute control of the air overhead. The air action is bound to be “widespread and sustained” and fought to a finish, with nothing less than dominance of the whole air ocean as the prize.

Until that action is completed, a combined or so-called triphibious offensive will be unthinkable. And when it is completed, such an offensive will have become superfluous. Whoever has conquered the air ocean will, for all practical purposes, have won the war. Lord Tedder’s mistake is in assuming that local air control of the World War II model will still be possible in the future. It is the mistake underlying our whole strategy of balanced forces to take and hold air bases inside the enemy’s orbit of major aerial operations.

I can see only one genuine exception to the rule about distant bases and that is England. Not so much because it is separated from the mainland by water but because it has the industrial capacity to generate and maintain its own air power on a scale to meet enemy onslaught. In this sense it comes close to being a continent in itself. As

long as the British Isles have the air power to "control their own skies, they cannot be invaded." \* Their air force will be a powerful ally in the overall struggle for dominance of the global air ocean.

We should not, however, bemuse ourselves with the expectation that we can deploy our decisive atom-bearing and other long-range strategic air force on the British Isles for purposes of sustained offensive against the Soviet Union. As long as those islands can be maintained as an intermediary operational base, our tactical problem will be enormously simplified. We shall also be able to use that base for escort aircraft. But when it comes to permanent deployment for sustained action, we are up against certain geographical handicaps.

In the first place, the British Isles are so close to the Continent that an enemy in control there will be in a position to employ also its tactical aviation against us. While tactical air force is not the proper weapon for strategic operations against British cities and industrial targets, as the Battle of Britain showed, it is a perfect weapon against strategic aircraft on the ground. On the surface, such planes are sitting ducks.

Secondly, dispersal is a vital defensive necessity. In the limited area of the British Isles the point of saturation may quickly be reached. Even in the last war the B-17's and the B-24's clogged the islands, bunched together wing to wing, in constant dread of destruction on the ground by Göring's long-range fighter-bombers.

Our own fighter-bombers, it should be recalled, were roaming over Germany—a much larger area—destroying enemy aircraft on the ground. To this day it is a mystery how the Germans overlooked the chance of retaliation in kind. Whether we can in any future war deploy in England the great masses of big long-range bombers needed for a decision, exposed to raids on the ground by fast jet and rocket-powered aircraft, is to say the least dubious.

Besides, the close intermeshing of industrial targets and air bases by reason of the limited space simplifies the enemy's problem. Both are profitable targets for his strategic air power. Concentration of our strategic aircraft on the ground would provide attackers with an alternate target if they failed to reach the primary target. Common sense dictates that strategic air force should be far enough away from indus-

\* Motion picture, *Victory Through Air Power*, 1943, narration by author.



trial areas to compel the attacker to divide his strategic air effort.

The relationship of the Japanese islands to Asia is roughly the same as that of the British islands to Europe. Japan, like Britain, can be maintained as an overseas base only if it can generate its own military might through its own industries. Before we dare consider Japan as a Pacific stronghold, we must rebuild and revitalize its productive capacity to a point far beyond what the country possessed before World War II. That would involve a Marshall Plan for Japan—indeed, for the whole Pacific—as lavish as in Western Europe: an enterprise that would put an intolerable strain on our already hard-pressed economic resources.

Japan's position, indeed, is much more vulnerable and isolated than Britain's. We can supply the British Isles by the northern route, providing a powerful air corridor for the requisite traffic. Our northern approach to Japan is cut off by the Kuril Islands, which we obligingly gave to Stalin as a present, prohibiting such a corridor. With China in Communist hands, the southern and eastern approaches will in addition be infested with submarines operating from Chinese and Siberian ports.

No strategic offensive will be feasible from the Japanese islands, whether by land or sea or air. Russia's strategic targets are more easily accessible from upper North America, and the supplying of Japan for major offensives would be too costly, if possible at all. We can hold Japan and other Asiatic bases only in the preliminary or cold-war sparring. Those bases are closer to the Communist heartland than to our own, placing us at an insuperable disadvantage. As soon as showdown hostilities began, such Far Eastern bases would be as untenable as bases on the other side of the Eurasian continent; the men and equipment planted on them would have to be written off.

It is illusory to talk of Indo-China, South Korea, and other limited areas as "footholds" on the Asiatic mainland. These are in effect overseas bases on a hostile continent. They are subject to attack by almost unlimited ground forces supported by tactical aviation, and by the enemy's strategic striking force as well.

Even if we could maintain strategic air force on Japan, it would have no legitimate strategic targets on the continent—except in Russia itself, and those could be dealt with more efficiently from the Amer-



ican mainland and the British Isles. Our air force in Japan would consequently be reduced to an essentially tactical role, directed primarily against communications.

But lacking adequate ground forces to exploit our tactical action in the skies, our "footholds" would rapidly become indefensible and useless. Their abandonment would be a matter of course. After that, the contest would be purely aerial: between Japan and other islands on the one hand, the Soviet Asiatic mainland on the other, in an effort at mutual neutralization. We would concentrate on air bases, submarine pens, seaports, communications—at Vladivostok and Kamchatka, for instance—while our adversary concentrated on Japan, the Philippines, the East Indies, and the rest.\*

Alaska, too, being far removed from our main source of power, cannot be counted on as a base for sustained, long-range, strategic air offensive. Yet because it is so close to Russia—only twenty-three miles at the narrowest point in Bering Strait—Alaska has a unique importance, especially in the opening stages of any war.

In Alaska, we must be geared for operations to smash and neutralize its opposite number: Kamchatka, Anadyr, and the rest of the Soviet region on the other side of Bering Strait. This is perhaps the only theater where old-style triphibious action, by land and sea and air simultaneously, would remain valid, at any rate on a limited scale. This is where much of our air-borne land strength and tactical air force should be deployed. For each country the fundamental objective would be to keep the opposing base neutralized.

The idea that the Russians could capture Alaska and use it for strategic bombardment of the United States is unfounded. Even if the enemy succeeded in landing air-borne troops and occupying air-dromes, he would not be allowed to make use of his victory. We could blast him out quickly with our long-range air force striking directly from our centers of strength.

Alaska cannot be analyzed in a vacuum, but as one element in our

\* The war in Korea is under way as this book goes to press. Whatever the temporary political and moral values involved, militarily the Korean struggle must follow the logic of modern strategic relationships here outlined. Under conditions of a full-scale war with Soviet Russia, we could not afford to hold Korea. An attempt to do so would call for an investment of effort and resources absurdly out of proportion to the meager military value of the little country.

overall strategic picture. Our life-and-death goal, determining the outcome of the war, would be to take control of the air space over Russia. While this supreme battle, conducted by long-range strategic air force, is under way, we dare not leave our "back door" open. We must have there a force-in-being strong enough to keep the Russian bear not only from our door but as far away as possible.

All this has shown, I trust, that no strategy for victory can rest on a steppingstone approach to the enemy. The highly appealing idea that war tied to overseas bases would keep the fighting away from our own shores is wishful thinking. Weapons for direct attack on our continent are available. With the most valuable objective—American productive capacity—located on our continent, they will assuredly be used. We cannot count on being undisturbed, and our people must be prepared for the shock.

The weapons the enemy will throw against our distant bases will be different in kind from those designed to destroy our industrial setup at home. To delude ourselves that we can hold off the enemy from America proper would be to repeat Japan's basic blunder. It was the hope of keeping war away from their own doorstep that prompted the Mikado's planners to extend their defense lines on scattered islands thousands of miles away. This, by enabling us to reduce their strength piecemeal, in the end exposed an undefended Japan to the full fury of our offensives.

The Japanese error is being lustily preached to us today by the advocates of far-flung bases. They would have us ring Eurasia with bases, scattering and dividing our air forces, stretching our lines of communication in a hundred directions, leaving us dependent on long overseas supply routes. The enemy would be able to gobble up our scattered strength piecemeal, so that in the final showdown he would face only the remnants of that strength, precisely as we did in Japan. Our continent would be as exposed as were the Nipponese home islands after Japan had dissipated its aerial potential overseas.

## THE MYTH OF THE AIRCRAFT CARRIER

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ALL THAT I HAVE SAID about fixed land bases within the enemy's striking aerial radius applies a hundredfold to the floating bases called aircraft carriers.

If a concentration of air force on an unsinkable island adjacent to Europe is untenable, by what magic will these smaller, infinitely more vulnerable "islands" be made tenable? If it is no longer possible to hold local air control over a limited land area, how will such control be held over the limited sea area represented by an aircraft carrier?

The only advantages claimed for the floating as against the fixed base are mobility and concealment—the chance to play hide-and-seek with the defending air forces.

But maneuverability reckoned at best in hundreds of miles is quite meaningless against airplanes covering thousands of miles. How a ship sailing six hundred miles a day can evade discovery by planes flying six hundred miles an hour the admirals have yet to explain. In listing the virtues of "the fast carrier task force," Admiral Louis E. Denfeld noted boastfully that "it steams at twenty-five knots or more." That may be relevant to submarine and surface threats. But from the sky-angle of the opposing air forces this "fast" surface group is for all practical purposes stationary.

Even in the last war, with planes cruising under two hundred miles an hour, this was true. The fact was dramatized by the fate of the *Bismarck*, one of the fastest and mightiest battleships afloat. After the engagement near Iceland in which the *Hood* was sunk, Allied naval forces tried but failed to maintain contact with this German vessel. But contact was established by the R.A.F. Coastal Command. Finally, on May 26, 1941, off the European coast, aircraft attacked

with torpedoes and shot off the *Bismarck's* rudder. The great vessel was turned into a helpless derelict, which was later finished off by the Navy. Where the *Bismarck* could not evade the slow sky hunters of yesterday, certainly naval task forces will not escape detection by the faster planes of tomorrow, equipped with modern radar.

That concealment is no longer possible was demonstrated, and formally confirmed, by the Navy itself in the North Atlantic maneuvers in 1949: the so-called Operation Argentina. A mighty hundred-ship task force attempted a Newfoundland invasion. According to Vice-Admiral D. B. Duncan it was theoretically sunk or crippled by a force of just eight schnorkel-equipped submarines. And the underseas assault was so devastatingly successful precisely because the invading force had been kept under unbroken surveillance by defender airplanes, which directed the schnorkel actions.

The "destroyed" fleet was grouped around six aircraft carriers, supported by the battleship *Missouri*, two light cruisers, twenty-three destroyers, and a variety of other ships and tankers, manned by a personnel of twenty-five thousand. In ships alone the force represented \$670,000,000 of national wealth and effort. Then eight submarines sufficed to eliminate the whole aggregation. Yet we are asked to believe that such fleets would survive in the North Sea, the Arctic, the Mediterranean, and other areas on the periphery of Eurasia!

Think of enemy carriers penetrating the waters off North America, let us say a few hundred miles from the Carolinas or California. How long would they remain operative under the terrific land-based air force we could hurl against them from above—while our submarines attacked from below? Even if they succeeded in striking a sneak blow before interception, their chances of escape would be infinitesimal. Traveling at 25 knots (27 miles an hour), and pursued by 500-mile-an-hour aviation, they would be doomed. No matter how strong the anti-aircraft defenses of a carrier task group may be, they will be swamped and destroyed by air power from the shore.

The picture in reverse—with American carriers in enemy waters—is no different. In the last war aircraft carriers as a genuine fighting element were barred from the Mediterranean, the North Sea, every other point defended by the German *Luftwaffe*. They did not venture into Japan's home waters until the fourth war year, when we had won

nearly complete mastery of the Japanese skies. The spectacular fighting record of our carriers has obscured the most crucial military fact: that in the last war carriers *never* challenged a continent genuinely defended by air force.

Nothing has happened since then to justify the belief that carriers will be able to do in the future what they could not do in the recent past. On the contrary, the greatly expanded range and striking power of defending land-based aviation has made the floating base that much more vulnerable.

Enlarging the size of the carrier alters nothing. Where a 35,000-ton vessel is barred, a 60,000- or 80,000-tonner cannot enter. It merely offers the enemy's airplanes a larger target, so that they can dispense with precision bombsights.

In meeting threats of attack from overhead, *dispersal* is an essential defensive principle, for obvious reasons. The carrier, whatever its size, violates this principle, representing the very opposite extreme: maximum concentration of planes, fuel, explosives, facilities, and personnel in the smallest possible space. A single well-placed blockbuster will sink or disable an 80,000-ton supercarrier as easily as the smaller carrier, stranding its entire complement of aircraft.

The great floating islands on which the American Navy has set its heart and its hopes are a military monstrosity. They would be half-billion-dollar expendables, good at most for one surprise assault before being annihilated. I have no doubt that when military history is written these proposed marine mastodons will be cited as a prime example of strategic folly and Navy desperation.

In the Bikini tests it was learned that ships offer an "unprofitable target" for atom bombs. In packaging such great slices of national resources in supercarriers, the Navy seems determined to make itself again a "profitable" target in the atomic era.

A decade ago Navy people still proclaimed the battleship as the "backbone" of their service. Whosoever disputed this law of nature—daring to point out that the battleship had been stripped of its strategic functions by air power—was accused of "attacking" the Navy. Before the last war was well started, however, it was clear to laymen that the alleged backbone was broken; by the time the war ended most naval spokesmen reluctantly conceded this truth.



Since then the admirals have argued that the aircraft carrier has supplanted the battleship. In the words of Admiral Forrest P. Sherman, Chief of Naval Operations, "The aircraft carrier has become the ship of the line. . . . For the foreseeable future, the fast carrier task force will be the principal offensive striking element in our fleets—the core of their offensive powers. . . ." \* But once the real nature of the carrier, as simply a floating air base, is understood, its present irrelevance becomes apparent.

The carrier emerged as a temporary substitute for range: ineffective, exorbitantly costly in life, hopelessly outclassed when it tangled with land-based defenders, yet useful as long as there were stretches of ocean inaccessible to aviation from terra firma.

With transoceanic aviation a flying fact, there are no such stretches left. The substitute therefore becomes a historical curiosity. That its usefulness is still claimed and seriously debated shows the tenacity of habit and sentiment. The carrier was a transitional device in a passing stage of strategic development. It acquitted itself nobly and merits a great salute of gratitude. But its job is done.

In Senate hearings soon after the war, General Jimmy Doolittle declared, rightly, that the battleship has been "obsolescent for twenty years and obsolete for ten." Then he added that the carrier is now "going into obsolescence." I would go a step further. Today it is not going but *gone*. It is already irretrievably obsolete. And since it is now admittedly "the core of the Navy's striking power," it follows that the Navy as a primary strategic force is likewise a thing of the past.

Every dollar put into carriers for strategic purposes from this point forward is a dollar thrown away. If it is diverted from genuine land-based air power and thereby retards its development, the investment is not only wasteful but positively harmful. That the Navy has turned to the outmoded carrier as the new backbone of the surface fleet is a measure of the lengths to which men will go to avoid breaking with their past.

Would anyone today, when airplanes span the ocean, recommend that passengers travel by ship two-thirds of the way, then cover the final third in aircraft catapulted from the ocean liners? But substitute

\* Speech at U.S. Naval Academy, December 5, 1949.



“destruction” for “passengers” and that is precisely the plan being pushed by defenders of carrier warfare. The carrier is adrenalin for the heart of old-fashioned sea power. It may prolong the agony but cannot prevent the destined demise.

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“NINETY-TWO PER CENT of the targets of any importance in the world lie within 1,200 miles of salt water. Any target in the world lies within 1,500 miles of carrier-based aircraft.”

As a fact in geography, this statement, made by Admiral Radford in Chattanooga on July 10, 1948, is indisputable. Its implications, borne out by other naval propaganda, are twofold:

1. That strategic bombing against 92% of all important targets can be conducted from carrier decks, and
2. That fighter escort for long-range land-based bombers like the B-36 can be provided by carriers against any and all targets.

The admirals do not flatter our common sense when they advance such propositions. To strike at targets at the specified distances, the carriers would have to poke their bows into the sands and rocks of the enemy coastlines. The opposing air power would not be obligingly retained at the distant targets but deployed on the edge or within a few hundred miles of the salt water. The only step in the process skipped by Admiral Radford and his colleagues is that of *putting their carrier task forces into position off the hostile coasts*.

Not until the naval forces were within 1,500 miles of the shore could they begin to strike—and not at strategic targets but only at the most advanced shore installations defending them. But they would have been subjected to enemy air attack while they were still twice that distance from the shorelines. Navy forces would thus be under a hail of explosives from overhead and a barrage of torpedoes from underneath for a distance of 1,500 miles—three days and three nights of sailing through hell—before their aircraft could so much as touch the outer edge of the enemy land mass.

Having reached the 1,500-mile line, whatever had survived of the original task force would be ready to strike at the most advanced of the enemy land targets. But by that time the opposing long-range air

## A STRATEGIC MYTH

Admirals state: "92 per cent of the targets of any importance lie within 1,200 miles of salt water. Any target in the world lies within 1,500 miles of carrier-based aircraft." This may be geographically accurate—but it is strategically meaningless!



1. The strategic target (A), 1,200 miles from the shoreline, is defended by air force on the coast (air base B). While the carrier (C) is still 3,000 miles offshore, it will be under attack from B by long-range aircraft, as well as schnorkel submarines.



2. After two days' sailing through this barrage, the carrier reaches a point 2,000 miles offshore, where medium bombers and battleplanes in greater numbers join the attack. The carrier's planes, with 1,500-mile range, cannot even touch the air base, let alone the target.



3. If the carrier survives and comes close enough to reach inland targets, tactical short-range bombers, fighters, torpedo planes—everything the defender has—will swell the assault. Unless the carrier can defeat the entire defensive air power of a continent, it will not survive to attack the target. In the last war, carriers never successfully challenged a continent defended by air-force-in-being—and they never will. This will hold true regardless of the size of the carrier; whether the planes involved are propeller or jet-driven; whether the bombs and missiles used are TNT or atomic; and whether fire power is conventional or of the "wonder weapon" variety.

force would be joined by medium bombers and battle and fighter planes in vastly greater numbers. How much of the bold task force would live through another three days and three nights under the intensified onslaught in order to reach the coastal waters? How many of the remaining aircraft can then be spared from the immediate job of protecting the task force to undertake strategic or tactical missions deep inland?

In effect, the carrier force would have to take on the entire striking aviation potential of the foe. It would have to win control of the skies singlehandedly in order to release its bombers for strategic action or its fighters for supporting missions. The undertaking would be doomed to annihilation.

These carriers, we are told, will carry jet fighters and bombers and will be equipped to deliver atom bombs. But this changes nothing. The enemy, too, will use jet aircraft and atomic missiles in attacking the carrier force. The introduction of improved weapons and explosives is a technological refinement without strategic significance, just as the better cannon, sights, and push-button elevators in the Maginot Line were without such significance. The jet planes will still be chained to an easily sinkable, highly volatile hulk, moving at a snail's pace. As an implement of air power it will still be clearly inferior.

When we allude to "inferior weapons," we do not necessarily mean weapons that are of poor workmanship or badly engineered. We mean that the military concepts or characteristics are unrealistic in relation to the strategy they are supposed to implement. This is an all-important difference that the public should understand.

A horse-drawn piece of artillery can be more ingenious in many respects, from a purely engineering point of view, than a self-propelled piece of artillery. The horse-drawn carriage may have all the engineering intricacies of an automotive vehicle. It may even incorporate an internal combustion engine with all of its complexities or jet or rocket power to assist the horse. The animal itself may be controlled by remote and radio-activated bridles, an automatic feeder of oats and water, with a mobile incinerator to dispose of the residue.

In all its detail, in short, it can express superb scientific ingenuity. Yet such a de luxe horse-drawn vehicle would normally prove inferior on the field of battle to an automotive vehicle. The basic fault would

not lie with engineering but with the military decision to employ horses instead of self-propelled vehicles.

Thus the aircraft carrier, in this age of interhemispheric ranges, is an "inferior weapon." In spite of all modern scientific trimmings, it is still a poor substitute for aircraft range. Today that range can be incorporated in the aircraft itself with greater efficiency.

I have used a far-fetched analogy, of course, to make my point: that there is a world of difference between tactical inferiority and engineering inferiority. A superb engineering product can be inferior tactically, and vice versa.

"The aircraft carriers, cruisers, destroyers, and Marines which have operated in the Mediterranean during the past three years," according to Admiral Sherman, "have been essential factors in the maintenance of peace and stability in the area. . . ." \* Without doubt. For this purpose even American rowboats would have served. Yet it is rather ingenuous to confuse peacetime policing with wartime combat.† He should have added, realistically, that those forces would be at the bottom of the Mediterranean immediately after hostilities broke out. They could not possibly survive a massed attack by the land-based aviation of a great Power. The Mediterranean, it should be remembered, was one of the seas which Allied naval forces evacuated and never again entered in the last war while German aviation held the air.

Of all the elements in the picture, the fact that all vital targets are within 1,200 or 1,500 miles of salt water is the least relevant. Carriers could approach neither Europe nor Japan as long as enemy air power was effective. That they should be expected to approach a continent defended by massive Soviet air power defies understanding.

Apparently impressed by Navy claims, a newspaper recently presented a map-diagram showing how the Navy proposed to strike at Russia from carriers disposed around Europe. The diagram had no qualms about placing carriers in the middle of the Black and Baltic Seas, off the Scandinavian coasts, in the Persian Gulf, and the Mediter-

\* Speech at U.S. Naval Academy, December 5, 1949.

† The deployment of aircraft carriers in the Korean incident should not foster illusions. It simply exemplifies a policing function under peacetime conditions against local insurgents. Should the episode prove to be the start of a real war, with major Soviet air forces challenging the U.N. intervention, dispatch of carriers to the scene would be unthinkable.

anean. Which would be a neat and helpful trick if it could be performed! How the flattops got through the narrows of the Bosphorus into the Black Sea, through the Skagerrak and Kattegat into the Baltic, was not specified, of course. It would have made interesting reading.

In such close waters within striking distance not only of enemy strategic air force but tactical aviation, the hapless carriers would be under a handicap of at least a hundred to one in relative striking power. Their defenses would be instantly saturated, everything they possess being absorbed in a hopeless battle for mere survival. Meanwhile, to make matters worse, they would be sitting ducks for hostile submarines as well.

A variation on the fallacious theme was offered by Admiral Denfeld in a speech at Wilmington, Delaware, on November 18, 1948. Alluding to the amazing mobility of his projected task force, he said:

"Imagine an area as large as the United States covered by ocean. A carrier task force on the border of Indiana this forenoon could launch a thousand-plane attack on Wilmington, and be in Texas tomorrow morning to duplicate its aerial bombardment on Jacksonville, Florida."

The Admiral blandly assumed that the defensive aviation at Wilmington and Jacksonville—indeed on the entire rim of the imaginary ocean—would remain inert while his task force splashed at leisure on the borders of Indiana, and that the adversary would remain conveniently asleep while his task force crawled along at twenty-five "miles" an hour from Indiana to Texas. He presupposed defenseless targets. He forgot that from forenoon today till morning tomorrow—while both Wilmington and Florida are beyond his range—his task force would be an easy and supremely vulnerable target for all the air force the enemy cared to concentrate upon his destruction.

For a carrier force to survive, it must be endowed with air power equal to that which the land mass can throw against it. Indeed, equality is not enough. Because floating bases are sinkable and the opposition operates from solid ground, aerial strength at least twice as great as that which the enemy can muster becomes essential.

No naval task forces of such astronomical scope can conceivably be assembled. Task Force 58 which struck at Japan represented a \$2,500,000,000 investment. With modern jet planes and improved carriers, an equivalent force today would involve some five billion dol-

## A STRATEGIC FALLACY IN FOUR ACTS

To deliver 513 tons of bombs against Japan, Task Force 58 concentrated 16 carriers, 8 battleships, 17 cruisers, 75 destroyers, a variety of other ships, with an aggregate value of \$2,600,000,000, although it faced no air opposition. What would happen if a future task force attacked the European continent, defended by formidable enemy air force, in waters infested by schnorkels? The theoretical answer, oversimplified for clarity, follows:

1. Aircraft carrier dispatches a bombing mission with escort fighters, retaining some fighter force for its own protection.

2. Because the carrier lacks sufficient fire power to defend itself, additional fire power must be provided by a battleship (in its new form as a *missile-ship*). To protect the battleship against air attack and schnorkels, fire power must be augmented by an array of cruisers and destroyers.

3. Since the original aircraft carrier does not have enough planes for adequate air cover, another carrier is added, to provide an air-cover umbrella. But the second carrier, like the first, needs heavy additional fire power against air and underseas opposition. It must be shielded by another missile-ship, with its supporting contingent of vessels.

4. This new surface force likewise calls for an air umbrella, necessitating a third carrier. And so the process continues indefinitely—until either arbitrarily amputated somewhere or extended beyond the range of the enemy's land-based aviation. With the present transoceanic range, theoretically the chain of interlocking task forces could extend clear across the ocean to the Brooklyn Navy Yard. In practice, however, our long-range land-based aviation, superior to the carrier task force in bombing and fire power, would challenge the enemy long before the multiplication is carried to absurdity.







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lars—and it could put into the air no more than two thousand planes. If it is to have the dimensions to weather battle against a major portion of the enemy's total air power, it would need not two thousand but twenty thousand aircraft—a fifty-billion-dollar potential. And that is just one task force out of the dozen or score presumably envisioned by the admirals quoted.

The Navy seems to forget that the effective striking radius of a carrier is not defined by the attacker. It is fixed by the performance capacity of the defender. If the major enemy aerial force can reach out for three thousand miles, the carrier planes need a range of three thousand miles *plus* the inland distance of the target to be attacked. When the skies are in friendly hands, we don't need carriers. When they are not, the carrier's striking radius should be superior to that of the land-based aircraft arrayed against it—which is, of course, an impossibility.

Thus we are driven to the realization that in order safely to bombard an enemy in Europe, a carrier should remain in the Brooklyn Navy Yard. I'll take Mitchell Field instead.

Can carriers bring escort fighters in support of our long-range land-based bombers, such as the B-36? Again, they could do so only if they were able to penetrate the home waters of the adversary and remain afloat after they get there.

In World War II, especially in the early stages, our bomber offensives both in the European and Pacific theaters were desperately in need of escorts. There were periods when the entire strategic bombing offensive against Germany was in grave danger of collapse, when the sacrifice of a few carriers would have been worth the risk to provide the critical fighter support.

The Navy did not take this risk. The odds were too heavy. It could not send its carriers to the shores of Germany to help our B-17's nor to the Japanese home waters to support our B-29's. Incidentally, this caution helped preserve the fable that carriers could survive against land-based aviation. The Navy preferred to sacrifice twenty thousand Marines to take Iwo Jima as a base for escort planes rather than risk its carriers, and risk the myth that carriers can provide fighter contingents in support of land-based bombers. Naval task groups will be

equally helpless to make a rendezvous with B-36's and other long-range bombers in any future war.\*

Carrier-plane escort, Admiral Sherman declared in an interview recently, should be provided for big Air Force bombers "under appropriate conditions." † He might have added that conditions will be "appropriate" only when carriers can risk entering enemy waters, which is to say when we are in control of the skies; but by that time land-based planes will be able to do the job—unescorted.

The very conditions which preclude our possession of fighter bases on terra firma close to the enemy continent will make it doubly impossible to plant floating bases there as a substitute. Only by closing his eyes to the overwhelming lessons of the last war can anyone say, as did Admiral Sherman in December, 1949, that the carrier task group "gives us the power to move wherever we choose against enemy shores." That is the one thing it cannot conceivably do against shores having modern defenses.

Carrier offensives against a country holding control of its air would be so many billion-dollar *kamikaze* suicide strikes. This assertion is supported by the whole record of World War II. When the carrier *Illustrious* attempted to operate against Italy, a handful of Stukas were enough to put it out of commission. Carriers were through in the Mediterranean, except to deliver fighter planes to Malta in a two-hundred-mile sneak run.

With one exception, carriers never dared challenge land-based aviation. The exception was the dramatic Doolittle raid on Tokyo on April 18, 1942, and that of course deteriorated into a one-way and one-shot operation basically *kamikaze* in character. The original plan was to bring the *Hornet* within four hundred miles of Tokyo. But the carrier was sighted eight hundred miles from its goal, and, fearing that the enemy had been alerted, the *Hornet* decided to turn back. General

\* In *Foreign Affairs* for April, 1950, Hanson W. Baldwin makes an extraordinary statement: "It is curious that we have never used Navy fighters, flown from carrier decks close to an enemy's coast, to protect the long-range bombers of the Air Force, flown from land bases far in the rear." It has not yet dawned on him, apparently, that Navy fighters were not used because it could not be done—because the carriers would have been promptly sunk.

† New York *Sun*, November 17, 1949.

Doolittle therefore ordered his B-25's to take off. All of the bombing planes and at least sixteen crewmen were lost, the survivors reaching friendly territory on foot.

No doubt the undertaking was worth the price, as a morale measure—chiefly for its effect on our own morale. The crux of the matter, though, is that selected crews under superb leadership, at high cost, accomplished very little from a strategic point of view. Only sustained action can be effective, but continuous action on a *kamikaze* basis would have amounted to a stupendous squandering of our resources.

No matter from what angle the problem is analyzed, the carrier task force is ruled out. It can operate only when control of the skies has been won—and at that point it will have been reduced to a ferry service.

Underlying all Navy arguments is the supposition that carriers—and armies—can be brought into waters adjacent to the enemy continent and subject to the total weight of enemy land-based aviation. *But the only "aircraft carrier" which can be anchored off the Eurasian continent is the British Isles.* To keep that "carrier" afloat and operative will call for the exertions of the whole British Air Force and the entire British population, plus substantial American support. The magnitude of the defenses that will be required to hold the British Isles as a base is a sufficient measure of the folly of trying to hold flimsy floating bases anywhere within the orbit of Soviet air power.

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LET US NOW CONSIDER the problem of submarines.

It is generally assumed that Soviet Russia has been building a formidable fleet of submarines, embodying the most advanced German knowledge in this field. Obviously, it has done so on the supposition that the United States will adhere to the orthodox World War II strategy; that we will try to transport millions of troops and leave ourselves dependent on tens of thousands of miles of supply lines, for transport of millions of tons of vital materials to sustain a far-flung network of overseas bases.

Should we decide to abide by that strategy, the Soviet investment would be fully justified. A profligate method of war-making to begin

with, it will be made more costly by underwater raiding. Russia will be in a position to drive us more rapidly to the brink of the bankruptcy inherent in an old-style land-sea-air conflict. On the other hand, if we choose to break with the past, to lift the war from the surface into the skies, the Soviet investment will prove largely useless. For in that case, the Red schnorkels would roam largely empty seas.

We would still need surface transportation to keep the British Isles adequately supplied, and there will be a large and increasing sea traffic along the coasts of North and South America. But the sea lanes to the British Isles will enjoy from the start the conditions which made a safe supply highway toward the end of the last war. The northern route—Canada to Greenland to Iceland to Britain—was provided then with a solid roof of land-based air force under which Hitler's U-boats found it increasingly profitless to operate. Our Air Force will suffice to safeguard this highway, though our naval hunter-killer task groups will offer additional guarantees of safety. Air protection of Greenland and Iceland is not "local" in character. Being flanked by the major air potentials of North America and the British Isles, these bases cannot be attacked without risk of a showdown battle.

Coastwise transportation in the American hemisphere will move through well-defined routes under constant and powerful awnings of air power anchored on the shores. Schnorkels attempting to penetrate under these shields will be engaged in suicide missions. Again, of course, naval contingents can and will add strength to our total defenses.

In the last war, our enemies could not strike at Allied sources of supply through the air. They did not have the necessary aeronautical reach. Therefore they were obliged to attack our sea lanes. That is why both Germany and Japan concentrated on submarine warfare. In the future, the primary targets will no longer be transportation lines but the *sources* of strategic materials. Long-range hostile air power geared for direct attack on our mainland obviously will have no trouble disposing of the closer and comparatively defenseless localities containing vital strategic materials. It will eliminate them by direct destruction or by using the threat of annihilation to frighten the local populations into strikes, sabotage, and passive resistance.

With the sources of strategic materials outside our own hemisphere

neutralized by opposing air power, the fact that we may possess the most powerful Navy in history, that we can keep our sea lanes wide open, will be totally irrelevant. Our Navy would convoy only empty ships.

Take a specific example. Suppose we tried to draw important materials for military purposes from the East Indies. Why would the enemy bother to interrupt our transport? Obviously it would make more sense to strike at the East Indies with aviation based on Red China to choke off the flow of supplies at the points of origin.

Unless we arbitrarily choose to stick to the outmoded pattern of war-making established in the last war, the great to-do about the expansion of submarine warfare in the next conflict will prove unfounded. The submarine is a weapon of opportunity, conceived to operate in waters inaccessible to surface navies. Its chief target is the enemy's merchant marine. But once the sources of strategic materials are demolished or otherwise denied to us, the merchant marine loses its wartime function.

In view of reports that Russia is focusing effort on submarine construction, there has been some clamor for at least American "parity" on these ships. One admiral made an explicit plea before Congress that we match them, unit for unit. But the whole idea is militarily meaningless. In time submarines are likely to be designed to destroy other submarines. As yet, underseas craft are essentially intended to destroy merchant-marine and other surface vessels. The size of an American U-boat fleet is therefore conditioned by the size of the Soviet Navy and the extent of Russian dependence on overseas commerce—which happens to be nil. Conversely, the effectiveness of the Kremlin's underseas fleet will be governed by the degree of our reliance on overseas sources of supply. In the measure that transoceanic supply lines become superfluous, submarines too become largely superfluous.

We should also bear in mind that airlift is constantly increasing. The time when a vital portion of the decisive matériel will go from the Americas to Britain by the air routes is not too far off. This will tend further to reduce the extent of our surface supply lines.

Of course, if we insisted on landing millions of men for colossal surface invasions before we had attained mastery of the air, if we



insisted on fighting Okinawa-type battles, then Moscow's submarines would have plenty of valuable targets. However, this will not happen even if we wish it to happen. It will quickly become apparent that such ventures are impossible until the adversary's air forces are destroyed—after which they will no longer be necessary.

Through sheer mental inertia we continue to think of the protection of shipping as a naval problem. Actually it had become an air-power problem even before the end of World War II. There was a time, in the early stages of that war, when long-range four-engined German Condor planes, reaching out five hundred miles westward of Ireland, accounted for fully fifty per cent of our shipping losses in the North Atlantic. Luckily for us, Hitler was "unsold" on long-range aircraft. He channeled his aviation potential into tactical planes in support of his army strategy, turning over the task of harassing American shipping to submarines. Thereby he relinquished control of the skies in the area to the Allies, which in turn enabled us to establish safe supply lines.

In the future, aviation based on the Eurasian land mass will reach out across oceans not to the extent of five hundred miles but thousands of miles, from shore to shore. As a threat to shipping, its neutralization will be the assignment of our major air forces, with the Navy reduced to a supporting role.

We should not, of course, discount the possibility that someday U-boats may be geared to deliver atom bombs against coastal cities. The fact that they will carry guided missiles with atomic warheads, however, will not affect the character of anti-submarine warfare. The answer again will be in aeronautical vigilance, with naval ships in auxiliary roles.

I for one doubt that submarines capable of firing atom-bearing missiles are in existence or can be developed within the next few years. The popular supposition that Russia has underseas craft capable of launching atom bombs overlooks the consideration that an airplane with a lifting capacity of ten tons is still required to carry such a bomb. Part of that weight, it is true, is represented by actuating mechanism that is fixed equipment on the aircraft. But the fact remains that subsonic guided missiles with atomic warheads for delivery from a safe distance cannot as yet be housed in the largest

submarine known. If they could be, they would be subject to effective interception, as we shall show in discussing guided missiles generally. To deliver the atomic charge by supersonic rocket-driven missile is an even more difficult assignment.

The German V-2—still the largest rocket extant, weighing fourteen tons—has an explosive warhead of only one ton. The installations for launching such weapons are so complex and bulky that the Navy is trying to get appropriations to modify *cruisers* as carriers for guided missiles. The notion that the H-bomb—if and when developed—might be launched from submarines is even more fantastic. Though information on the proposed bomb is meager, there is reason to estimate that a rocket capable of delivering an H-warhead across a few hundred miles would weigh perhaps four hundred tons, or three times as much as the B-36, the largest bomber extant. The assumption that our cities are already menaced by atom-carrying U-boats is therefore very premature and doubtless must be credited to psychological warfare on Moscow's part.

In theory it is quite conceivable that submarines might lay atomic bombs in enemy harbors in the same way that they lay conventional mines. For the bomb to be effective, however, the submarine would have to penetrate to the heart of a harbor. The precautions against such an eventuality are so elementary and positive that the procedure can be safely discounted.

As to non-atomic guided missiles, the disposable load of explosive warheads that an underseas craft can fire in this fashion is insignificant. This, coupled with the fact that the action would necessarily be on a hit-and-run basis, makes the threat so minor in strategic terms that it can have only nuisance value.

Submarines, as Admiral Sherman rightly emphasized, will have to be fought not only in open waters but at their bases and points of origin in shipyards. They will have to be attacked, the Admiral said, "in the coastal waters and bases themselves." \* But obviously naval forces will not be able to do this until the air overhead is conquered—and that is a function of an Air Force. The problem in blasting submarine nests and shipyards is the same as in attacks on other shore and inland targets, which could not be undertaken by carrier task

\* Associated Press, December 2, 1949.

forces in World War II and will be even less accessible to such forces in the future. Many shipyards in Russia, incidentally, can be established deep in the interior, on rivers emptying into the high seas; against these, naval power will be as irrelevant as against any other targets in the heartland.

There is reason to believe, moreover, that *science may before long eliminate the submarine altogether*. Its only advantage, as compared with surface vessels, is in the concealment provided by water; it is a weapon of surprise. Should water become "transparent," should it become possible to detect underseas targets by new means as readily as those on the surface and in the air by radar, submergence will be useless and even a handicap.

This is precisely the direction of invention progress, and we are on the verge of success in this respect. A hint that the submarine is doomed was given recently by Rear Admiral C. B. Momsen. "I have reason to believe," he declared, "that the solution to this problem is just ahead, and if my prediction is correct, submarining will become a mighty dangerous business." ■

One of the most significant effects of science on war-making since the last conflict has been the virtual cancellation of the concealment provided by nature. In the air, darkness, clouds, and fog ceased to be shielding elements; observation, detection, and firing became completely electronic. Consequently all weapons became dependent entirely on their own combat capabilities. In the final stages of the war, sonic, electronic, and magnetic devices for locating submarines were being perfected. Inevitably water will lose its ability to serve as a cloak and when we are able to detect underwater craft unerringly and keep them under constant surveillance, submergence will no longer offer protection. The submarine will then be a goldfish in a glass bowl. It will have to rely solely on its speed, firepower, etc., and in these it cannot compete with pursuing aircraft.

The highly advertised miracles of the schnorkel, the hydrogen-peroxide motor that propels the U-boat without access to the outside air, atomic propulsion that may allow the underwater craft to remain submerged indefinitely—all these will be quite beside the point. The submarine will lose its offensive power, and the national wealth

■ Associated Press, March 27, 1950.

invested in forces and weapons accumulated to fight it will be so much waste.

Until then, of course, this tridimensional weapon obviously enjoys an incalculable advantage over ships glued to the surface. It has been forecast that the schnorkel, with its self-seeking torpedoes, will be a hundred times more deadly than the U-boat of the past. Remembering that the last war was nearly lost through the destruction of our shipping, the magnitude of the menace becomes apparent. To cope with it is beyond the industrial and manpower capacities of our country.

*We therefore dare not stake our destiny on a strategy that demands an almost astronomical concentration of shipping.* Our aim must be to lift the conflict from the surface, thereby by-passing the submarine and leaving the enemy to "hold the bag" of misdirected investment.

## THE END OF SEA POWER

## 1

THE COMPLAINT that airmen are "attacking" the Navy is both silly and pathetic. Railroad builders were not attacking the stagecoach, which lives on as a romantic memory, just as battleships will live on. Those who at the turn of the century foresaw that the automobile would displace the horse-drawn carriage were not attacking the horse and buggy. The whole business of treating technical evolution as if it were a brawl is senseless.

The Navy's place in the heart of America is secure. The issue is its place in the future pattern of security. We are dealing with the reality of changing weapons which dictate changing strategies.

It seems to me suicidal to make navies and an outmoded naval strategy the foundation of American national defense. Those who insist upon leading America in that direction are heading us for military disaster. They assume a fearsome responsibility before the judgment of history.\*

These sentences appeared in print six months before Pearl Harbor. They suggest that airmen foresaw the disasters which were to descend upon us in the Pacific. But we deserve no laurels for seeing what any eye raised to the skies could not miss; an understanding of air power gave us the key to an understanding of the new strategic equations.

Soon thereafter a lot of others realized that reliance on naval ideas had left us exposed and handicapped. The "first line of defense" was smashed and by-passed. One after another, British and American

\* "Twilight of Sea Power," by the author; *American Mercury*, June, 1941.

strongholds in the Pacific fell under the blows of enemy aviation. From the outset the Navy's historic function of assuming command of the seas was taken over by air power.

Naval contempt for the air threat at the outset of the war was exemplified by the way the *Prince of Wales* and the *Repulse* deliberately sailed into Japanese waters without air cover. Of course, they were promptly sunk by enemy land-based aviation. After that, battleships did not again venture from under the umbrella of air power. Our surface fleets could move freely only within the orbit of our air control, except where the aeronautical backwardness of the enemy exempted patches of ocean from the new conditions.

The decisive sea battle taken for granted in naval planning, in which battleships would slug it out "face to face" as in the past, never took place. Now and then our admirals taunted the Japanese Navy to come out of hiding and fight. It was empty bravado. The enemy admirals would have been feeble-minded to venture from under the roof of their land-based aviation.

The pattern for the new type of "naval" engagement was set by the battle of Midway in June, 1942. Though touted to this day as a great naval battle, it was strictly an air battle, in which aircraft did the fighting and ships provided the targets. At no time in the three days' action did surface vessels make direct contact. Japanese carrier planes fought for control of the skies against American carrier planes and aircraft based on Midway Island. When Japan lost four carriers, its Imperial Fleet retired.

"We gained control of the air at sea and carried the war to the enemy," Admiral Arthur W. Radford told the House Armed Services Committee in October, 1949. The part of this statement about control *was* true for the ever-shrinking portion of sea beyond the reach of shore-based air power; by now that portion has shrunk to precisely nothing. But the claim of having carried war to the enemy is mythical. The Navy merely helped to carry land-based aviation to the Marianas, from which our Air Force carried war to the enemy mainland.

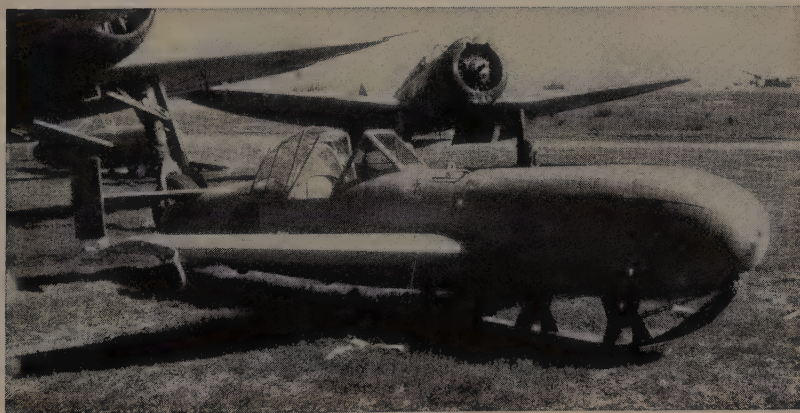
After a few catastrophic tries, sea power did not again approach the coasts of German-held Europe. In the Pacific it helped capture bases for strategic aviation and delivered a few feeble blows against Japan proper in the final stage, after the country was mortally stricken.





WHAT THE JAPS DIDN'T HAVE: 22,000-pound British bomb of the type that sunk the "impregnable" battleship *Tirpitz* with a direct hit. By contrast, the Japanese tackled our Navy with bombs not exceeding 1800 pounds, crude adaptations of Navy shells.

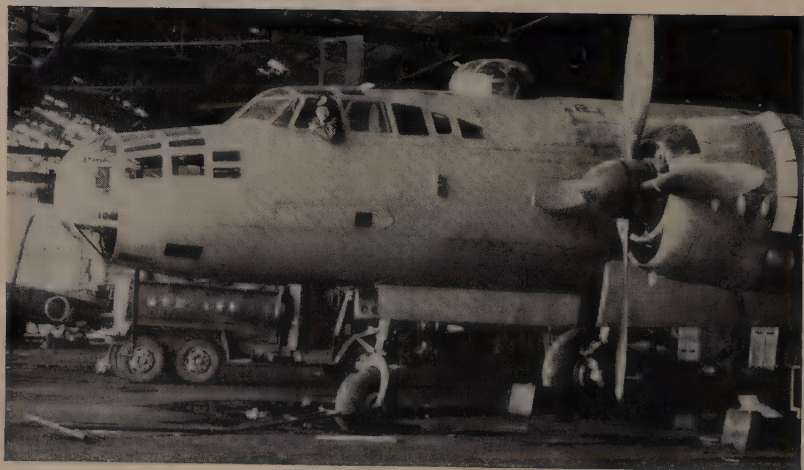
WHAT THE JAPS DID HAVE: Kamikaze bomb, its nose filled with explosives, its pilot sealed into the cockpit. At Okinawa, these suicide projectiles were carried by a bizarre assortment of aircraft; after release, the locked-in pilot steered for collision with the target. The Japanese frequently dumped these helpless human bombs into the ocean at the first sight of our fighter planes.





ALSO TOO LITTLE AND TOO LATE: *Above*—German ME-262 jet fighter planes on the production line in Ota, Japan. Here, as in Germany, they were built too late to effect the fight for air control.

*Below*—Belatedly, the Japanese began to build this powerful four-engine bomber; only four had been test-flown by the end of hostilities. Outside of flying boats, Japan did not possess a single four-engine bomber, making the advantage held by our B-17, B-24, and B-29 a decisive one.



It was when relatively long-range air force was thrown into the fray that the tide of war turned in our favor in the Far East. The elaborate invasion plans, made in deference to traditional assumptions and expectations, were canceled out by air power. As General Doolittle has put it: "The Navy had the transport to make the invasion possible, the ground forces had the power to make it successful, and the B-29 made it unnecessary."

The Pacific conflict began with a gigantic and humiliating naval disaster. It was not merely due, as most Americans kindly assumed, to temporary negligence. It was due to a fundamental underestimation of the threat of air power. Our admirals honestly regarded a great fortified harbor as a safe retreat; they actually felt strong in their "massed might" in Pearl Harbor, ready to meet and lick the opposing Navy. Along came the Mikado's airplanes and blew up their delusions. The massed might simply offered a more convenient target for air power.

The refusal to understand and prepare for the new situation was the more reprehensible because the air-power facts had been on view in Europe for two years. The Battle of Britain, the occupation of Norway, events in the Mediterranean, including the battle of Crete, the episode of the aircraft carrier *Illustrious* had given plenty of notice that traditional sea power could now be by-passed through the skies. Although the yes-men among military analysts were content to echo official Washington views unthinkingly, a good many non-conformists did try to draw the strategic moral from the unfolding European experience.

Pearl Harbor and the series of crushing defeats that followed were no accidents. They were the direct consequences of the Navy's dominance over our military thought and especially of its long and successful fight to hold back the development of strategic air power. Convinced of the eternal primacy of sea power, Navy leaders for a generation had stymied the "encroachment" of the airplane on their private preserves, the high seas.

The Navy was then politically influential enough to inflict its special astigmatism on our whole military program. The fact that we began the struggle without the kind of long-range aviation called for by Pacific distances—and the resultant need for a strategy of island-

hopping—must be charged in large measure against the arrested thinking of our naval leadership.

True, surface fleets, regrouped around carriers, did a heroic job in the island-hopping campaign. They helped win bases from which air power was ultimately able to strike at the Japanese centers. But there would have been less call to conquer those bases at such tragic cost in life and treasure if the Navy in prewar years had not succeeded in throttling our air power.

No one can or should minimize the difficulties of island-hopping or the brilliance and superb courage with which it was accomplished. But battleships were never used in their primary function of destroying their opposite numbers and taking command of the seas. Admiral Mahan must have turned in his grave as the \$100,000,000 mastodons of the sea were used as assault barges against Pacific atolls.

The Navy, by preventing the development of air power, had itself created the problem it was solving. With the proper aircraft at our disposal, we could have stormed Japan through the air from the start—from India, China, the Philippines, Alaska, and other bases already in our possession—saving the thousands of lives and years of fighting it took to conquer an oceanful of tiny islands.

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OUR NAVY was able to carry out its secondary task of acquiring air bases solely because we were fighting a third-rate nation. Had Japan possessed even halfway modern air power, the American Navy could not have operated anywhere within range of enemy land-based aircraft. It is not yet generally realized how backward and inefficient Japanese equipment was.

For example, the largest bomb dropped by the Japanese Navy was only about 1,800 pounds—and a crude adaptation of the ordinary naval shell at that. The largest bomb of the Japanese Army was only about 1,000 pounds.\* That explains why so many of our carriers and ships survived direct hits and were able to limp away for the duration

\* The U.S. Army Air Force used bombs up to 10,000 pounds, the R.A.F. up to 22,000 pounds. It was a 22,000-pounder, called a "grand slam," that sank the battleship *Tirpitz*.



of the war, which in turn promoted the myth that ships can survive within the striking range of land-based aviation. Despite this, our surface fleets suffered heavy damage in taking islands. What if the enemy had dropped explosives such as we and most other belligerents were using? What of the future, when supersonic, rocket-driven, homing missiles will penetrate surface ships with the greatest of ease—striking with speeds of over 5,000 feet per second, as against about 1,000 feet by shells and bombs in the last war?

We came shockingly close to losing the battle of Okinawa; for a long time the result hung in the balance and American naval losses were terrific. Had the Japanese been hurling blockbusters instead of inferior missiles, the story certainly would have been different. At that, the enemy might have won if not for the decision of General LeMay to throw B-29's into a tactical assault on Kyushu airdromes, grounding the remnants of the enemy's air power.

The lingering delusions of admirals that they can approach an enemy mainland derive from their misinterpretation of the Pacific experience. Japan, as already noted, spread its limited air force through hundreds of atolls, each endowed with small doses of land-based aviation. This stupidity enabled us to eliminate a major chunk of enemy air force by overwhelming one fragment after another. For reasons that are still obscure, Japan never attacked our naval contingents in force, with a view to imposing major damage, but sent always a handful of airplanes.

That providential tactical picture will never again be repeated. There are no atolls around the Eurasian continent on which Soviet Russia, if it were minded to copy the Nipponese blunder, could spread its air force for easy destruction in detail.

Its land mass is one continuous air-power platform. No matter from what direction Russia is approached from the sea, it can meet the threat with a vastly superior air force. Mass is a traditional principle of Russian war-making. The Kremlin will employ its air forces on the same scale as it did its infantry and artillery. A naval task force mustering, let us say, two thousand ship-based planes will be confronted by ten times as many land-based planes. It will need most, if not all, of its aircraft to protect its ships, leaving little if any aviation to spare for offensive purposes.

In a press interview, Fleet Admiral Halsey said with disgust: "When we entered Sagami Bay on August 27th, we were met by almost the entire Jap Navy—a miserable, dirty, depressing, old-fashioned destroyer. I was ashamed of ourselves then that it took us four years to finish a war with those people." \*

His shame was anachronistic. The size and quality of the Jap Navy had little relation to the war just ended. It did not take us four years to defeat that Navy, as the Admiral implied. It took that long to *carry our air power to Japan*.

Admiral Halsey's bewilderment was matched by Admiral Sherman's confusion. "The situation in which one of the major military powers of the world is brought to defeat without defeat of its army," he declared, "is unparalleled in history and creates problems which have to be solved without the guidance of past experience." †

An extraordinary statement, indeed, when one recalls that American airmen, beginning with General Mitchell right after the First World War, had foretold that very thing—the surrender of nations to air power while their surface forces were still intact. Why do we still have to "solve" the problem when the Japanese experience is spread out for observation? Sherman and his colleagues evidently refuse to believe their own eyes. They cling to the notion of sea power as a first line of defense. They stick by the slogan—I am quoting Admiral King—that "any step that is not good for the Navy is not good for the nation."

As late as the end of 1945, Admiral J. O. Richardson opposed revision of the military structure on the plea that "the present organization of the War and Navy Departments is the result of over one hundred and fifty years of experience." It did not occur to him that cavalry, which had enjoyed an experience of thousands of years, was crossed out quickly by the advent of the automotive vehicle.

Surface vessels will always have a logistic function. When air superiority enables them to sail under friendly skies, they will transport men, munitions, medical supplies, etc., as needed. But so far as combat functions are concerned, navies are a thing of the past. They cannot venture into the open until control of the seas has been es-

\* Associated Press, October 15, 1945.

† Associated Press, August 21, 1945.



tablished by air power, and they can contribute nothing directly to that objective. There is no fighting they can do which aviation cannot do better and more quickly on its own.

This is a bitter pill for naval leaders to swallow; I say this in honest sympathy. The new reality hardly fits into their peculiar ingrown professional mystique. Former Secretary of War Stimson in his memoirs refers to the "dim religious world" of the Navy, "in which Neptune was God, Mahan his prophet, and the United States Navy the only true church." The "high priests," as Mr. Stimson calls them, seem incapable of grasping the facts of change and obsolescence.

The reduction of navies to ancillary roles has not been imposed by airmen but by the march of science. It is a historical decision which no prestige propaganda, no administrative reforms, no patching of the Navy can reverse. The sooner this is recognized, the sooner we shall emerge from the clouds of confusion around security problems.

Petrified naval theory is an incubus which weighs heavily on defense planning. The piteous demand that we sink a major portion of the nation's resources into naval armaments against a potential enemy who neither possesses nor fears sea power is irrational. After all, a monument to the ancient glories of sea power can take a less expensive and less cumbersome form than a seven-ocean Navy built around useless aircraft carriers.

A POPULAR MISCONCEPTION, fed by Navy publicity, is that the final destruction of Japan proper was accomplished by Army-Navy teamwork in a kind of fifty-fifty combination of land-based and carrier-based striking power.

Actually, Army aviation dropped 156,699 tons of bombs on Japan as against 6,781 tons dropped by carrier planes: 96% as against 4%. Moreover, the naval forces could move forward to contribute their 4% only after the Japanese air forces had been virtually eliminated. Roughly half of the Japanese air losses had been inflicted by the Navy—because the enemy had scattered his strength on numberless tiny islands. The other half was brought about by the forces of MacArthur; his military skill, coupled with General Kenney's profound under-

standing of aerial warfare, had advanced the "bomber line" and ultimately won command of the air. Nor should it be overlooked that the destruction of the Japanese Navy in its home waters by carrier aviation was made possible by B-29 operations.

By April, 1945, the Japanese government had given up the attempt to ship anything but food. To tighten our strangle hold, we went after what was left of the enemy's merchant marine. Japanese merchant shipping avoided the vulnerable supply routes and hugged the coasts. The job of destroying and bottling it up was assumed by air power.

Some 1,600 of the B-29 sorties flown during the final months of the war were devoted to aerial mining operations; more would have been flown had mines been available. Over 12,000 mines were dropped in less than five months, virtually clogging the navigable waters in and around the Japanese home islands. It was a mine-laying effort without precedent in military annals. Since the birth of the mine, its use had been considered a vital naval function but this, too, has been usurped by air power. About 770,000 tons of shipping were destroyed and another half-million tons swamped the repair yards. At the same time aerial assaults left only 3 of the 22 shipyards open for operation.\*

Let us have the record straight. American naval task forces did not dare to enter Japanese waters until February 15, 1945, which is to say until enemy skies were substantially in our hands. Japan's shipping had been destroyed; its remaining airplanes were in large part grounded by lack of fuel. Only then did the mighty naval Task Force 58 manage to make a direct strike against the enemy mainland. Admiral Sherman candidly admits that the men of that task force "were amazed at the lack of determined air opposition. No Japanese aircraft came within twenty miles of our disposition and our planes roamed at will over the enemy's territory seeking their targets." †

Even at that point the Navy relied on the Air Force to cover the

\* "The mines dropped [by B-29's] were of the so-called 'unsweepable' type. . . . Shimonoseki Strait . . . was so thickly sown with these mines that many ships attempting its passage were sunk and it had to be closed to traffic. The whole Inland Sea was planted with thousands of them. Their removal was a tremendous problem at the end of hostilities." *Combat Command*, by Frederick C. Sherman, Admiral U.S.N. Ret'd; Dutton, 1950, page 369.

† *Ibid.*, page 336.

operation with B-29 action from the Marianas, 1,800 miles away. In a diversionary offensive against vital targets, to draw off Japanese air force from our Navy, LeMay's bombers delivered 1,600 tons of explosive—so that the Navy between February 16th and 25th could deliver 513 tons of bombs and rockets in puny doses. Rarely has there been a more absurdly useless naval enterprise.

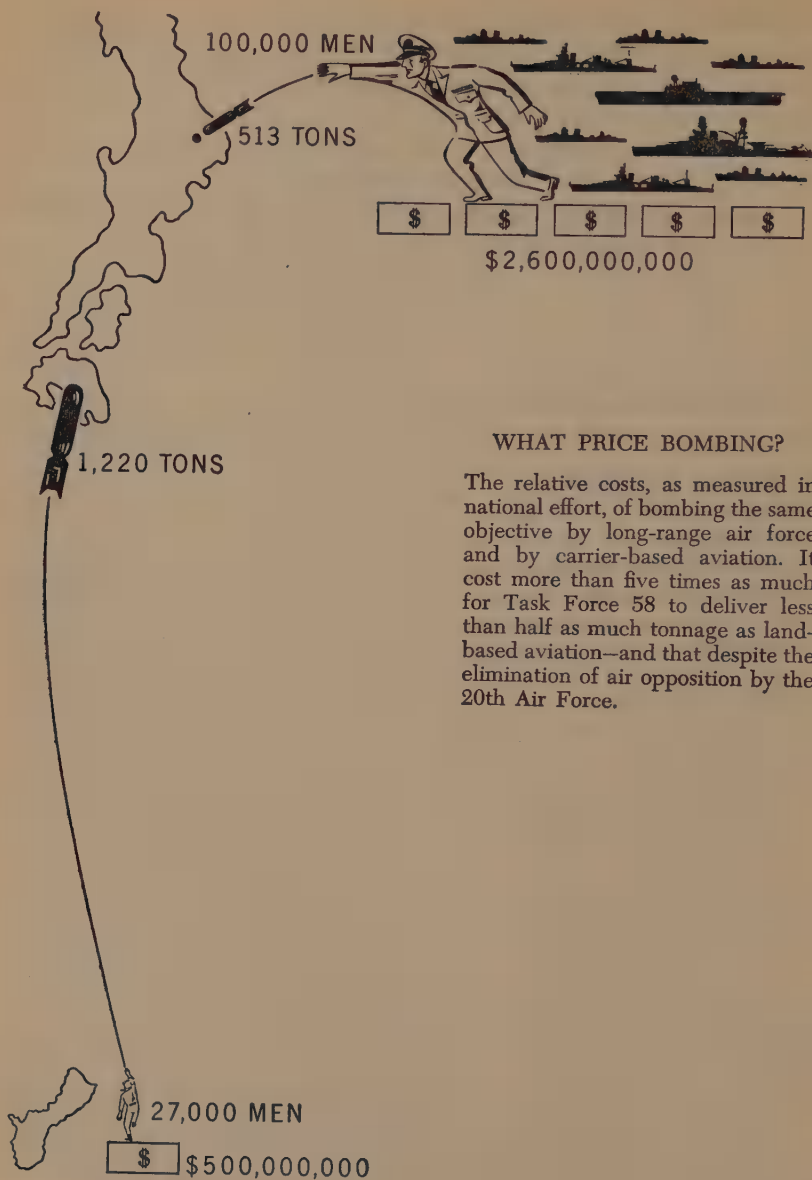
To tickle Japan with its 513 tons, Task Force 58 assembled \$2,600,000,000 worth of national effort—16 carriers, 8 battleships, 17 cruisers, 75 destroyers, and an array of other vessels—of which it lost 10% in three days of action. The armada carried a personnel of nearly 100,000. This meant 200 men and about \$5,000,000 of national substance for every ton of bombs delivered.

The Twentieth Air Force, enlisted to "support" this effort, consisted at that time of 167 B-29's. The total cost of this force, including construction of air bases on the Marianas, was roughly \$500,000,000. Its personnel was 54,000—half of it the legitimate manpower of the Air Force, the rest inactive with advanced echelons awaiting additional bombers. During the three days in question the 167 Superfortresses dropped 1,220 tons on the mainland. Per ton of explosive, this meant 20 men and \$400,000 of national investment.

There we have the ton-per-ton contrast: at the naval end 200 men and \$5,000,000 of investment; at the air-power end, 20 men and \$400,000. This 10-to-1 ratio tells the story. Task Force 58 absorbed tenfold effort and manpower—and required Air Force cover besides. But its job, if it needed doing at all, could have been accomplished with one-tenth the effort by the air forces and without Navy participation.

For the entire period of operations from the Marianas, Air Force calculations disclose even more startling figures. Eighty tons of explosives were delivered to Japan by our B-29's for every \$1,000,000 of investment; this includes, of course, the cost of building and maintaining the bases. Meanwhile, aircraft carriers delivered only 2% tons for every \$1,000,000 of investment. Carrier operations thus cost 35 times as much.

Why, then, did the Navy go through with the comedy of a carrier "offensive" against Japan proper? General LeMay had protested against the project. Marine General Holland M. Smith had begged



### WHAT PRICE BOMBING?

The relative costs, as measured in national effort, of bombing the same objective by long-range air force and by carrier-based aviation. It cost more than five times as much for Task Force 58 to deliver less than half as much tonnage as land-based aviation—and that despite the elimination of air opposition by the 20th Air Force.

for the support of Task Force 58 in the Iwo Jima operation. But the Navy had its own way. Its objective, I suspect, had little to do with the war then in progress; it was related to future wars. The admirals were eager to establish that their task force could carry war to the enemy, that it could attack shore installations and industrial potentials in the enemy homeland even in this air age.

These overriding political motives, it seems to me, can be discerned in the Iwo Jima episode, which General Smith in due time aired in anger. He believed that he needed at least ten days of pre-invasion naval bombardment and carrier-based air attack. His naval superiors, however, had assigned top priority to the dropping of those 513 tons on Tokyo, so they gave him only three instead of ten days of support. "It was a shocking situation," the Marine General has written. "We were haggling like horse traders, dealing with irreplaceable lives and irreplaceable ammunition." \*

We were in the fourth year of the war. For eight months our Superfortresses had been pounding the Japanese home islands. For three months the Air Force had maintained a relentless strategic offensive from the Marianas. The Navy, the self-styled first line of defense, had not yet fired a single shot or dropped a single bomb on the Japanese homeland. Whatever the cost, whatever the pleas of the Marines or the complaints of the air generals, it was determined to make contact with the enemy mainland before the show was over.

The Iwo Jima operation was tactically helpful from the Navy vantage point. It was a mustard plaster to draw off Japanese aerial force and thus facilitate the Navy "offensive." In choosing to deny General Smith's plea for pre-invasion support, the Navy was in effect using the Marines as a decoy to make possible the delivery of those meaningless 513 tons of purely naval warfare. No one, of course, can estimate how many of the 20,000 Marine casualties on Iwo Jima were sacrificed to promote an operation more political than military in its nature.

Another aspect of the sad tale was alluded to in Congressional testimony by Admiral Ralph A. Ofstie, who seemed blissfully unaware that he was "sinking" the Navy's carrier arguments in the process.

"The reason for the bloody seizure of Iwo Jima, resulting in twenty

\* *Saturday Evening Post*, November 20, 1948.

Control of the air over the seas means command of the air over areas adjacent to all waters bordering on the enemy country."

A journalist might be forgiven for supposing this miracle can be accomplished by carriers. There is less excuse for Admiral Blandy, who asked for "a Navy adequate in men, ships, aircraft, and other weapons" to assume control of the seas. What he actually demands, then, is enough carriers and carrier planes to challenge and defeat the entire air power of the Eurasian continent. We could not hope to attain that sort of ship-based aerial superiority even if we abolished the Army and the Air Force and channeled all defense appropriations into naval aviation!

It is amazing that naval men, knowing that the first and paramount job of a navy is to defeat the opposing navy, do not seem to see the exact parallel in the skies. One after another their witnesses before Congress harped on the problems of strategic bombing, glossing over the more vital question of defeat of the enemy air forces to assume control of the air space.

Whether avoidance of the issue is deliberate or unconscious, it is significant. The admirals sense that if the center of discussion were to shift *from bombing to air control*, the entire edifice of Navy argument would collapse. Once the American people recognize the essence of the matter—that the immediate and all-important purpose in a coming war will be the battle for air mastery—they will also recognize that the Navy can contribute nothing to this supreme goal.

We have pointed out how Admiral Ofstie inadvertently refuted the crucial naval claim that carrier-based aircraft can defeat land-based aircraft. Admiral Blandy's testimony would seem to clinch the refutation: "In the Okinawa operation," he testified, "the Navy alone lost ten thousand men killed and wounded." It was "our most costly campaign in any war," he said, though "there was no enemy fleet. . . . Those casualties were caused almost entirely by land-based *kamikaze* planes."

In other words, the Navy tackled a nation shorn of sea power and air power alike, except for a miscellany of poorly organized and poorly equipped suicide aircraft, whose bombs averaged only five hundred pounds. But this pathetic land-based force came close to



defeating the massed strength of a modern American Navy, shielded by the best naval aviation of the time, and imposed upon us "the most costly campaign" of the war! We need only apply the Okinawa experience to the future, when resistance will be offered not by the bizarre leftovers of a beaten nation but by a major air force at peak efficiency. We would need not one or a dozen supercarriers but several hundred, at a cost of three hundred to five hundred billion dollars, and even then we are likely to be outclassed by land-based aviation.

"Who can say we will not fight another campaign of the Okinawa type in another war?" Admiral Blandy exclaimed.

Coming from a military man who still has influence on strategic decisions, the rhetorical question is truly disturbing. The Blandys seem to have understood nothing and learned nothing from their war experience. Stubbornly, defiantly, they continue to plan the coming war in terms of island-hopping to advance the bomber line—though bombers operating from our own shores are already in the skies!—and to provide springboards for great land invasions.

Anyone who does not arbitrarily dismiss aeronautical facts and looks at a map showing the Russian-American geographical equation can say definitely that "another campaign of the Okinawa type" has become impossible. Moreover, were new Okinawas to be fought, the Navy, by this admiral's own testimony, would be utterly impotent to help.

But further Okinawas are precisely what we would not wish to fight if they were physically possible. That Pacific island was conquered bloodily for the sole purpose of massing troops for an invasion that never took place. Do the admirals actually believe that in another war we will concentrate millions of troops on Sakhalin or Sicily or any other equivalent of Okinawa for another invasion? These islands will be helplessly exposed to the full striking force of enemy air power; to undertake such massing of men before we have assumed control of the skies above would be suicidal.

Since the war the last areas in which naval vessels, including carriers, can operate—before the decision in the skies—have been erased. In the future, naval activity will be confined primarily to the defense of home waters. This will greatly increase the relative importance

of the Coast Guard in our national defense set-up. But sea power in the strategic sense is finished. It will remain in vestigial form as an auxiliary anti-submarine and transport force. But even these uses are temporary.

In time of peace, or under conditions of limited conflict, aircraft carriers will still be useful to support punitive or policing operations of restricted character—provided they are directed against minor adversaries without the necessary air power to deal with carriers. But such operations will have absolutely no relevance for a global struggle between two great nations. In a real war, all overseas bases within the range of the enemy's major aerial striking force will be untenable—and that includes "floating bases." Carriers will have to retire until control of the air over the whole planet has been won by our Air Force.

There is something truly heartbreaking about the attempts of the Navy to stave off and deny the inevitable—the kind of emotion one feels toward "the last of the Mohicans" in James Fenimore Cooper's novel. The end of a noble breed is always touching.

## THE ORDEAL OF NAVAL AVIATION

## 1

IN THE strategic fade-out of sea power in our generation, the real martyr is not the sailor but the naval aviator. He belongs to the new military order of things yet is sundered from it by walls of doctrine. He is leashed to surface ships by chains of naval ideology and service loyalty. Small wonder that the most moving protests against the supposed "crucifixion" of the Navy have come from its young air officers. They speak with the voice of frustration. Somehow they have been trapped in the fiction that there is a real if inexplicable difference between air-over-water and air-over-land.

Any aviator, regardless of the uniform he wears, must see the vision of air power controlling the entire air space. But the naval airman is obliged to think only in terms of control of the segment of the air over salt water. His, at bottom, is the psychological dilemma of an alien enlisted in the wrong army. . . .

The division of air control into oversea and overland elements still had a certain justification in the last war. We were fighting a global war and needed nothing less than global air mastery. It was attained in due time in the form of a mosaic of local air controls, some of which were won and held from floating bases. But since then the entire air space around the globe has become a continuous arena of operation. Were we to grant that the Navy has a special obligation to maintain control of air-over-water, the Army by analogy would have to be entrusted with control of air-over-land. That would merely reopen the great debate on independent air force, as a new military power, which has been settled by history.

The independent Air Force must be able to control its entire medium, the air, without reference to whether the surface below is wet or dry. Battle for control of this medium is the function of air power,

exactly as battle for control of the seas used to be the function of sea power.

The irony of the naval aviator's plight is that there is a natural affinity between air and sea power. Douhet and Mitchell might not always find a common language with Clausewitz, but they speak the same strategic idiom as Mahan. The military problems and laws of action of air and sea power are almost identical—merely transposed to the third dimension.

The parallel holds true even in basic matters of weapons and their disposition in balanced task forces. Unlike armies, which seek to seize and hold limited territories, both navies and air forces seek to conquer total mastery of the *whole* of their respective mediums.

Surface ships, in straining for greater speed, tend to break the restraints of water. Watch a speedboat in action and you note that it attains momentum by skimming the surface and even rising momentarily above the waters. Technologically, the airplane is an extension of the surface vessel, the climactic stage in the evolution of ships through the sprouting of wings. Had naval men grasped this fact imaginatively, they could have become the understanding sponsors of air power and the inheritors of the new force.

If strict logic ruled mortal affairs, navies would have evolved naturally into air forces. The men raised in naval doctrine needed only wings to apply their knowledge and training in the third dimension. The old Navy would have been transformed into an Air Department, in which a bureau of ships continued to deal with the remaining and fast obsolescing functions and equipment of what used to be sea power.

Unhappily, they missed the point, and grabbed at the airplane merely as a means of enhancing the battleship which it was destined to make obsolete. They took a stance of hostility and competition with relation to the new force. Obviously it is today too late for any such transition. Through its stubborn and clannish conservatism, the United States Navy has staked a vested interest in petrified concepts. Some of its leaders do have a confused intimation of the historic chance they muffed to become the instrument of third-dimensional warfare. This is evident in their crude attempts to *redefine* sea power as air power.

One retired admiral recently declared in so many words that sea power is air power. Then a journalist writing in *Collier's*, and obviously reflecting his naval sources, found it possible to assert: "The Navy brass staked their all on the supercarrier when they first planned it. They gave up a battleship, the *Kentucky*, a battle cruiser, the *Hawaii*, to get funds for the big carrier. They wagered the whole future of the Navy on the belief that *air power was to be a major Navy weapon.*" ■

Which, of course, is military gibberish. It is as irrational as saying that land power is a weapon of the Navy. We get exactly nowhere with such verbal shenanigans. The weapon of sea power is the fleet; the weapon of land power is the Army; the weapon of air power is the Air Force. If the Air Force were accepted as the ultimate expression of maritime military strength, then the purpose of sea power would be to take command of the skies and guarantee freedom of air navigation. But that can be accomplished only by superior air power, so we are back where we started. In effect, such naval sophistries define the Navy out of existence.

Yet there is a glimmering of truth in the groping intuitions which prompt naval reasoning of this sort. The admirals and especially the Navy's aviation personnel sense the close resemblance between sea and air strategy. They are baffled by the fact that somehow it was the Army rather than the Navy that developed the air force of true aerial strategy, which in due course established its autonomy as authentic air power.

They do not realize that their own reactionary temper—their knowing hostility to an independent air force—was responsible for this state of affairs.

PERSONALLY, I have my naval education to thank for my awareness of aerial warfare. As a student in the Imperial Russian Naval Academy I was deeply interested in naval history, strategy, and tactics. Already my mind was focused on the emerging airplane; my father, it happened, had been the first private owner-pilot of an airplane in Russia.

\* "We Need Carriers and the B-36," by Richard Tregaskis; *Collier's*, October 8, 1949.

But I did not see any contradiction between my naval training and the new force. On the contrary, the airplane seemed to me essentially a *ship* that sailed in another medium. I thought of it as rising above the water in the same sense that a submarine submerges below the water. Every one of the naval principles I had learned seemed to me directly applicable in the skies. Naval force and air force (puny infant though it was at the time) appeared to me as essentially synonymous.

After being commissioned in the Navy, I took postgraduate courses in aeronautics both in the Navy and the Army. Later, as combat pilot, then as Chief of Russian Naval Fighter Aviation of the Baltic Sea, I automatically transposed naval doctrine into air terms. As early as 1917 we began to fly our bombers in formation, for common defense, very much like naval formations on the surface. Later, fighter formations seemed to me a natural practice, with firepower concentrated on a single target. In the Gulf of Riga my air force had to support the extreme northern flank of the Russian Army; we operated day and night against German trawlers, mine sweepers, submarines, and other naval units; we carried out operations against Navy ground installations and airdromes on the coastline.

Thus in three years of fighting we gained experience with diverse ground and sea targets. But we were continually frustrated by the inadequacy of the means at our disposal. Being also an engineer, I began to ponder—as many other airmen were doing throughout the world—what could be done with better equipment: bigger planes, larger bombs, greater firepower, speed, and range. To me, air force did not represent a competitor of naval force but naval force in three dimensions. I thought it only natural that navies should develop long-range bombers and fighters which would eventually supplant ships. I did not reckon with the ingrown conservatism of the naval mind.

Arriving in the United States in 1918, I discovered that while the Navy's aviation was efficient, naval aviators were retarded in their ideas on the application of air power. Army airmen seemed to be the first to grasp the doctrine of pure air power and the most devoted in working for its implementation. By the time the naval aviators of the world woke up to the reality that the functions of navies were being taken over by "warships with wings," they were committed to opposing and blocking that evolution.



The initial function of military aviation in the dawn of the aeronautical age was reconnaissance. Airplanes became the eyes of the Army and Navy alike. But there was one difference between the two services which had far-reaching consequences.

Army aviation was immediately organized into separate units. The Army airman lived apart from the rest of the Army and tended to develop his own viewpoints and psychology. His naval counterpart remained a part of the general personnel, living on ships and on naval shore installations.

This contrast was reinforced by the experience of the First World War. Except for a few minor episodes—naval air combat in the Baltic, the forays of British flying boats against the European coast, the participation of Italian naval planes in bombing missions—naval aircraft remained strictly reconnaissance force. They were not prompted by combat experience to envision a strategic role for air power.

But the Army air forces of all belligerents were called upon from the outset to fight opposing air forces. They quickly made the discovery that in order to carry out their missions they must overcome resistance in the air. Control of the skies became the essence of their problem. This lesson did not fit into the tactical assumptions of Army strategists, so that a great estrangement developed between Army Air Corps officers and regular officers.

In the perspective of time, the tension between air and ground officers can be recognized as a fertile and fortunate fact. It was not the Navy but the Army that produced "rebels" like General Billy Mitchell, and great thinkers like Colonels Hickham, Andrews, George Kenney, Tooey Spaatz, Harold George, Hugh Knerr, Bob Olds, to mention only a few. Though my own ideas had been derived from naval doctrine, I found myself at home with the men of the U.S. Army Air Corps. They welcomed me into their family and we have worked together ever since.

High Army brass, of course, frowned on the exotic and heretic notions that flourished in their Air Corps. Every attempt of the airmen to exceed their prescribed duty—as a part of ground operations—was squelched. But this merely stimulated independent thought, as persecution often does. Talented men in the Army air forces were impelled to speculate, to read and study and improvise. They caught the

vision of air power as an independent military force and—despite obstacles, often surreptitiously—they conceived the equipment for translating the vision into actuality.

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THE ATMOSPHERE in the Navy was quite different; in a sense it was more understanding and congenial. Though they denied that the airplane could ever menace the battleship, the admirals did place a high value on aviation as a species of naval artillery. They took the young airmen to their bosoms and indoctrinated them with fundamental naval ideas and traditions.

Instead of persecuting them in Army style, the Navy high command glorified its airmen; middle-aged admirals learned to fly; in purely tactical application naval aircraft were given ample leeway. Where the Army feared competition for its artillery and cavalry, the Navy—certain in its mystical soul that the battleship was eternal—saw in aviation only a powerful naval weapon worth encouraging as such.

"In the Navy," Admiral King, who acquired his wings at the age of 48, told me in conversation back in 1936, "we are naval officers first, airmen second." He summed up the attitude of top Navy officers toward aviation. With planes of transoceanic range still in the dim future, naval aviators had no reason to think in terms of strategic bombing. Their ships would bring them within range of any targets. All they needed to do therefore was to perfect the performance of their airplanes and step up their own skills to assure the ability of the ships to get to the scene of action. For the most part they felt themselves part and parcel of the Navy—sailors with wings—and not, like so many Army airmen, the captives of a hostile service.

Thus, while the Navy produced the more efficient dive bombers, Army aviation produced long-range strategic bombers. Those bombers were exacted from the Army by what amounted to an underground air-power cabal. The planes were given to the rebels grudgingly to keep them quiet. Then came World War II and the despised theories of the cabal suddenly became legitimate doctrine.

Meanwhile naval thinking remained frozen. Discreetly and adroitly the admirals avoided sending their aircraft units within battle distance of land-based air power, except in the Pacific where, as we have

noted, the enemy's ineptitude had fragmented and dissipated Japanese air power to a degree where even carrier-based aviation could dispose of it piecemeal. In this fashion, the illusion was fostered that air power did not materially affect Navy principles.

When unification of the services was proposed after the war, the strongest resistance came from the Navy. In the end it yielded, conceding that strategic air action belonged to the newly established Air Force. But its agreement rested on a wishful-thinking assumption—that direct air action from our own shores was, if not impossible, certainly far in the problematical future.

Meanwhile, as the admirals saw it, air power could function only from a chain of overseas bases. These must be conquered and supplied by the Navy, which must also win and hold the air over oceans. The primary role would therefore continue to be played by the Navy, unification and an independent Air Department notwithstanding.

The air generals, eager to cut the umbilical cord tying them to the Army, confirmed this picture. I am not telling tales out of school when I assert that for the most part they knew better; since obtaining independent status, they have been fairly candid in telling those tales. Intercontinental air action, rendering the carrier obsolete and bypassing overseas bases, immediately took first place in Air Force thinking and planning, and the Navy was edged out of the strategic picture.

The chief victims of the situation were the young naval aviators. They had been encouraged to think of themselves as the admirals of tomorrow, a dream inseparable from the aircraft carrier, and therefore doomed to fail by the iron law of technological progress.

Naval airmen have been so thoroughly indoctrinated in the carrier operation, to the neglect of the strategic employment of air power, that many of them actually cannot grasp the implication of range. Chained to ships like galley slaves, they did not have a chance to breathe fresh strategic air. The lessons of the tremendous experience of the last war were lost on most of them. The Navy gave them no opportunity to produce great strategic minds.

Those who do by now grasp their predicament realize that they have no future in the Navy; at best they foresee ultimate transfer to the Air Force, probably with loss of rank. Their special skills—skills of a high and exacting order—have been outmoded.

General Spaatz recently told part of the story in a magazine piece:

When Congress established the Department of National Defense, the United States Air Force was made an equal partner in a joint land-sea-air team. But the law was so drawn as to make it impossible for those who had started air careers in the Navy to transfer to the Air Force. This was done against the advice of some experts, including the late Secretary of Defense James V. Forrestal, who recognized the need for free interchange of personnel among the services.

As matters stand, a complete air career in the Navy will be impossible unless naval aviation continues to be emphasized beyond its true requirements and against the decision by Congress to assign the primary air-power role of the Air Force.\*

Small wonder that naval aviators feel themselves cheated by fate. Some, at least, of the bitterness in their public pronouncements is directed against their own admirals. They begin to sense that the Navy, in denying and rejecting modern air power, has maneuvered itself into a historical blind alley. It has denied its aviators the right to grow, the right to achieve a strategic role.

Naval airmen would not be aviators if they could not recognize the obvious truth: that it does not make any difference whether a plane rises from the water or land or a ship's deck; the important consideration is what it is designed to do after it becomes air-borne. But this is precisely the truth they are not permitted to act upon by Navy concepts and Navy loyalties.

The time has come for Congress and the American people to close the artificial gap between air-over-water and air-over-land. The Navy should retain some aviation for a while, but simply and solely in close support of ships and against submarines. When our Air Force has won the aerial battle for mastery in all the skies, the component parts of the Navy, including its carriers, will be able to venture forth. Naval aviation is no more a part of air power than other species of naval weapons carried by ships for the benefit of the ships.

\* *Newsweek*, October 17, 1949.

## HIROSHIMA AND NAGASAKI

## 1

THE ATOM BOMB is a horribly destructive weapon, the most devastating ever used. To accuse anyone of "underestimating" its fury amounts to impugning his sanity.

But awe-inspiring as it assuredly is, the atom bomb does not call for a moratorium on accurate observation and military logic. It must be studied calmly in the cold light of military science. Unless our minds dominate the bomb, the bomb will tend to dominate our minds. World hegemony will then fall, by default, to those of tougher nervous fiber who refuse to be intimidated or stampeded by the new factor.

There has been, in my view, far too much loose talk, fright talk, and exaggeration around the advent of the atomic missile. Too many people with ideological axes to grind—pacifism, world government, isolationism, Sovietism—have seized upon the atomic weapon for their own purposes. The confusion has been worse confounded by the outcries of guilt-stricken scientists, brilliant in their own area but amateurs in the military and political fields.

As a result of the general hysteria we were in danger, on the one hand, of generating a false sense of security so long as we thought we had a monopoly of the bomb. We are still in even more danger, on the other hand, of a false sense of defeatist despair. If, as some proclaim, the next war will see neither victors nor losers but only universal annihilation, then the will to resist aggressions may crumble, the inclination to appease bullies may be encouraged.

The average citizen may be excused if his thinking about the bomb is a bit fevered; but that military minds should be touched by the same fever is inexcusable. Precisely because the new weapon is so terrifying, those charged with working out strategy have an obliga-



tion to remain unterrified. Which brings us to the report submitted to President Truman in 1947 by the Air Policy Commission. While it was a civilian study, it reflected high-echelon thinking. And in relation to the atom bomb it made a most erroneous assumption.

The report divided the *strategic position* of the United States into two "phases": (1) the period when we have a monopoly of the atomic missile; and (2) the period when a potential enemy would also have it in quantity. It set the year 1952 as the likely dividing line.

A more unscientific and misleading conception could hardly be imagined. In effect it promoted a fear, the fear of Soviet bombs, to the rank of a *strategy*. The Rubicon was crossed earlier than expected, though it may be 1952 or later before Soviet Russia has the bomb in quantity. But what actually will be changed when airplanes on both sides, instead of transporting TNT and incendiaries, are in a position to transport atom bombs?

Offensively we shall still need to fight our way through the enemy's air power and other defenses to attack his critical targets. Defensively we shall still need to intercept or defeat enemy aviation seeking to attack us, just as if it were conveying old-fashioned blockbusters. Of course, the penalties for failure will be heavier, the rewards of success more impressive. But the strategic relationships will be unchanged.

Suppose that Soviet air power proves strong enough to deny us access to the skies over its territories. Of what use will our atom bombs be in that case? After all, it doesn't really matter what kind of destruction you *can't* deliver.

We could proceed with the business of bombing the enemy's war-making machine only after having weakened or removed his aerial opposition. The atom bomb may make the process more expeditious—although, as we shall see, other types of explosive would also have to be used. Having conquered the right of way in the air ocean, we could act to reduce the enemy country to military impotence swiftly or slowly, with whatever explosives seemed to us most desirable. Once your opponent is disarmed, it makes little difference whether you subdue him with the threat of a pistol, a knife, or a club.

Or suppose, conversely, that the enemy succeeds in capturing control of the skies over the United States. Our atomic superiority would in that event do us not the slightest good. Once he enjoys freedom



of navigation over our land, he will be in a position to destroy us at his leisure—with atom bombs if he has them, or with the conventional TNT explosives, or, for that matter, with sacks of potatoes. As for our stockpile of atom bombs under those circumstances, it would be utterly useless. Worse, the immense industrial potential tied up in atomic production would then represent a frozen asset. To the extent that it reduced our aviation production, it obviously will have helped the enemy to take command of our skies.

After the Bikini tests, more than one journalist stated, as if it were a self-evident law, that the relative military strength of nations hereafter would be measured by their relative stockpiles of atom bombs. But the core of a strategy is not in the superior explosive. It is in the superior means of delivery, and today that means air power. A new strategic era does not begin when a potential enemy acquires better explosives but only when some nation works out a better technique for “getting at” its foes. The nature of the destructive agent used merely affects the efficiency of the process.

The “phases” identified by the Air Policy Commission were thus, militarily speaking, a division in time without strategic significance. They provided a classic example of the confusion induced by the dramatic character of the atomic weapon and must be credited to atomic jitters rather than military insight.

Sir William Beveridge, the noted economist, writing in the *London Times* immediately after the Japanese atom bombings, made this remarkable statement: “The atomic bomb has almost certainly relegated all other weapons of modern war—tanks, battleships, guns, rifles, and trained conscript masses—to the museum.”

The items he listed are agencies for delivering an explosive charge. To confuse them with the explosive itself, the atom bomb, is plain muddle. The explosive and the means of delivery cannot be measured by any common denominator—any more than you can weigh apples in inches or measure distance in pounds. Tanks, battleships, etc., can be canceled out by a new method of transporting destruction, not by a new explosive.

Perhaps it was to be expected that an economist would find himself confused in a field as alien as military affairs; or that nuclear scientists should be equally confused. Great physicists do not necessarily com-

prehend the arts of war. Impressed and frightened by the fury of the new explosive, obsessed with a sense of personal responsibility for having helped unloose the scourge, they have talked of it as if it were *a new military force* superseding all existing military forces. They proclaimed it the "absolute weapon," Promethean, cataclysmic, and so on.

But the key fact is that the atom bomb is simply another explosive, *not* a military force in the sense that the Army, Navy, and Air Force are military forces. It is immensely, horribly more destructive than any hitherto known. But before it can be instrumental in scoring a decision in war, it has to be delivered, like any other explosive, by one or a combination of military forces at the right time to the right place.

It equips the existing forces—and air power in particular—with another and vastly more effective tool for demolition. To that extent it steps up the significance of air power. But it does not revolutionize the basic principles of war-making.

To the layman, I realize, that may sound like an academic distinction. It is the distinction, however, which enables us to understand the place of the atom bomb in our national defense. As long as war has not been outlawed in the world, we must have a military establishment. As long as we have a military establishment it must be geared to win if and when called into action. Should we let a vague awe becloud our thinking, the one certainty is that we will be crushed when the test comes.

The real novelty of the bomb, aside from the magnitude of its destructive power, is its three-in-one character. It produces blast; it is incendiary through flash-heat; and it is poisonous through radioactivity. Thus it presents terrific devastation in a single package.

This package, though, is decisive only when it is in the hands of a belligerent geared to conquer the air ocean through which it must be delivered. Such a belligerent, however, could readily win a war without the atom bomb—even against an adversary who is atom-rich but poor in air power—by the process of destruction in a lot of small packages.

Scientifically, atomic energy is indeed an epoch-making innovation. But it does not at this stage rule out the strategy based on preponderant air power. On the contrary, it enhances that strategy

by giving it a more effective weapon—in much the same way that naval strategy was enhanced with the invention of long-ranged, large-caliber artillery, the torpedo, or radar sighting.

We hear talk about a bomb so potent that it will wreck continents at one blow and maybe explode the planet itself. If such a device could be produced, we may be sure some scientist would build it; and having built it, we might expect him to detonate it, just to prove that it works. Obviously in that case the problems of national defense, and for that matter all other human problems, would be greatly simplified. Concentration of effort on the as yet theoretical hydrogen bomb has revived the fears of such an infinite chain reaction that will dissolve all the oceans and consume our globe.

From all I know, including personal observations of atom-bomb destruction, such imaginative horror is exceedingly premature. The destructive force of the bomb is being stepped up. Yet for the predictable future it must remain a finite quantity. There will still be practical and tactical limits to its size and effectiveness. This holds true for the projected H-bomb as well as the stockpiled A-bomb. As we shall see further on, a bomb “a thousand times more powerful”—the quite arbitrary estimate, regarded as exaggerated by some of the men working on the hydrogen variant—would have a radius of destruction only ten times greater. Scarcely a pleasant prospect, but still a finite weapon.

There will even be a point at which further expansion of explosion in one missile will become wasteful and self-defeating. I venture to suggest that the earlier direction of research will be reversed—in an effort to obtain smaller rather than bigger bombs, to give us better control of destruction in atomic attacks, and to avoid excessive and useless killing.

The emergence of the atom weapon like the advent of more terrible weapons in the past—the Big Bertha, the torpedo, poison gas, the flame-thrower, the V-1 and V-2 missiles—points up the wickedness and stupidity of war. No one hates war more deeply than those who specialize in the arts and instruments of war-making. No one is more keenly conscious of its senselessness. The atom bomb assuredly presents a new challenge to the intelligence of mankind to abolish war.

But the science of war-making continues to make sense. *Far from nullifying military strategy, the atom bomb puts a higher premium on correct strategy.*

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I WAS in England when the atomic bombs were dropped on Hiroshima and Nagasaki. Naturally I was excited by the new development; my whole life's experience had predisposed me to credit the miracles of science.

From the teeming newspaper and radio accounts I visualized the total devastation of the unhappy cities in one-millionth of a second. "The only way we could tell a city had been there," one dispatch quoted returning airmen as saying, "was because we had seen it a moment before." With my mind's eye I saw the instantaneous evaporation of the cities and their people, not a building left standing in the stricken areas, sand and earth fused to glass, steel dissolved, thousands of human beings "vaporized" in the twinkling of an eye.

Because they were so often and so unanimously repeated, I credited the stories that the ground was heated to an incalculable degree, instantly extinguishing all life and destroying matter. I agreed, as a matter of course, with those who declared that if the bomb were dropped over a battle fleet, the heat would melt the vessels and evaporate the surrounding oceans and generate "tidal waves." In short, I accepted the popular picture of *apocalyptic destruction*.

One curious fact did stir vague doubts in my mind. It was a photograph of Hiroshima after the bombing in which a concrete building stood upright in the midst of the bombed areas, near the center of the explosion. I wondered by what chance one structure evaded the phenomenal force. All the same, if I had not journeyed to Japan and investigated for myself, if I had not witnessed the Bikini experiments, I would perhaps have continued to share some of the illusions so common on the subject.

In disputing my subsequent findings, certain scientists suggested politely that since I am not a physicist I had no right to discuss the atom bomb. I could only return the compliment by suggesting that since these gentlemen are not engineers they had no right, by their own rule, to discuss structural demolition.

One does not necessarily have to comprehend the origins and composition of an instrument to employ it skillfully or to appraise its effects. The expert photographer using complicated chemical processes produces brilliant color prints though he knows little or nothing about the composition and manufacture of the developing solutions. Any good chemist knows more about TNT than General Spaatz does, but this did not hamper the General in destroying Berlin.

A nuclear scientist may of course also be a first-rate engineer and a perspicacious statesman. But his superior knowledge of the nature of atomic energy does not by itself endow him with final authority on war-making and peace-making, even in the atomic age. Scientists have as much right to inject themselves into strategic or political issues as anyone else—but no more. I feel satisfied that most of them will agree with the common-sense view that superior knowledge and achievement in one field does not per se qualify a man as an expert in all fields. Too many physicists, since A-Day in Japan, have set up shop as sociologists, statesmen, and, above all, strategists.

For the most part they take the air-power thesis and transpose it into atomic language. They substitute “atom power” or “atom bomb” for air power and imagine they have discovered new strategic laws. Consider, by way of example, the eminent atomist Dr. Harold C. Urey. In his contribution to the book *One World or None* \* he writes:

“The most industrialized countries will be the most vulnerable and the most likely to be attacked by atomic bombs. These weapons stopped the Second World War, and at the same time they ended the defenses of the United States.”

To begin with, Dr. Urey overlooks the fact that it was air power, enabling us to impose surrender without surface invasion, that “stopped” the war in the Far East. More important, it was not the new explosive which “ended the defenses of the United States.” The new strategic era was ushered in with the invention of the airplane, making possible the delivery of destruction through a medium until then inaccessible. The natural defenses of our continent were ended when that airplane achieved its transoceanic striking range, enabling an enemy to reach the American industrial heart through the skies.

Dr. Urey is quite right in warning that a highly industrialized coun-

\* McGraw-Hill, 1946.



try is today the most profitable target. But the advent of the atom bomb did not create this condition; the principle held true long before this bomb was devised. Back in 1942 I explained that "the United States, as the world's most industrialized area, is also the most vulnerable to aerial attack. . . . Industrial concentration is essential to modern civilization, but unfortunately it runs counter to national security in the light of air power." \*

The destructive power of the bomb has merely enabled men like Dr. Urey to recognize the revolution in war-making brought about by aeronautics, about which airmen have been trying to tell them all these years. Even today they seem unwilling to understand the core of the matter, so that they attribute to the explosive a military power inherent only in air force, irrespective of the explosive.

The atomic physicist can tell us the amount of energy and radioactivity released. But those who have studied demolition are better equipped to estimate the effects of that energy. It is as an engineer and a specialist in the grim business of military destruction, without any pretense of special atomic knowledge, that I approach the problem.

I have had a most intimate and intensive experience with what explosives can do. My military career indeed began with demolition—I was nearly demolished for good. On my first night bombing mission in 1915 in the Baltic Sea, my plane was shot down. When it hit the water, our own bomb exploded in the cockpit, killing my observer and blowing off my right leg. Upon returning to the front I was bombed and shelled with everything the Germans could throw at me. My headquarters were showered by the heavy bombs of the Kaiser's airplanes and Zeppelins and I saw what they did to installations. My naval air base was the target for fourteen-inch shells from German battle cruisers; I know what these can do to a target.

Against that initial background, I have studied demolition in every conceivable form. In 1921, at the request of General Billy Mitchell, I was appointed Special Consultant to the War Department. My specific assignment was to reduce my concepts of an automatic bombsight to a workable model, and the end product was the world's first synchronous bombsight. In line with this undertaking I had to study

\* *Victory Through Air Power*, pages 102-3.



aerial bombs and their effects on various targets, taking part in a great many experimental bombing runs as well as demonstrations at proving grounds. I worked with General Mitchell in the bombs-versus-battleships tests of his day.

Thus I brought thirty years of experience with explosives and diverse targets to the task of investigating demolition in its manifold forms during the recent war. In the capacity of Special Consultant to Secretary of War Robert P. Patterson, I had a unique opportunity to make observations and deductions in hundreds of areas of Europe and the Pacific. I became thoroughly familiar with every brand of damage from high explosives, incendiaries, liquid fire, artillery shells, dynamite, atomic explosives, and combinations of several of these agents. As an engineer who knows how to build structures of given strengths and as an airman who knows how to destroy them, I feel justified in dealing with demolition, whatever the instruments used to accomplish it.

After visiting the major areas of the Pacific, I arrived in Japan. I began the study to which I had been assigned by making an aerial tour of the islands of Honshu and Kyushu, which encompass the main portion of industrial Japan. I flew over Tokyo, Yokohama, Yokosuka, Nagoya, Osaka, Kobe, Akashi, and dozens of other towns and cities which had been subjected to intensive air attack. Some of these towns are so close together that they seem almost continuous industrial sites.

All of these areas of annihilation presented approximately the same visual pattern. The smaller towns were totally burned out. Seen from above, the prevailing color was pinkish—the effect produced by the piles of ashes and rubble mixed with rusted metal. Similar pinkish carpets were spread out in the larger cities, except that among them stood large and small modern concrete buildings and factory structures, unscathed bridges, and other objects that had withstood the impact. Many of the buildings, of course, were gutted by fire, but this was not apparent from the air.

The center of Yokohama, for instance, seemed almost intact when seen from an airplane. Osaka, the Chicago of Japan, was an immense expanse of pink crisscrossed with white lines—the streets—except in the more modern center of the city, where concrete buildings had survived. The long industrial belt stretching from Osaka to Kobe

had been laid waste by fire, but with few exceptions the factories and other concrete structures were still standing.

It was, on the whole, a picture strikingly different from what I had seen in German cities subjected to demolition bombardment; quite different, too, from the picture presented by the Osaka arsenal—the most devastated high-explosive target I have seen on either side of the globe. The difference derived from the fact that Japanese destruction was overwhelmingly *incendiary*, with comparatively little structural damage to non-inflammable targets, whereas in Germany the destruction was of the *demolition* type.

Finally we flew to Hiroshima.

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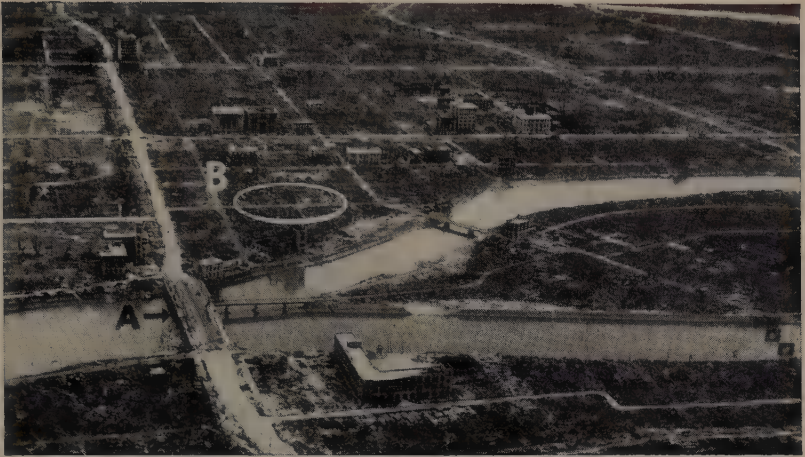
I was keyed up for my first view of an atom-bombed city, prepared for the radically new sights suggested by the exciting descriptions I had read and heard. But to my utter astonishment, Hiroshima from the air looked exactly like all the other burned-out cities I had observed!

Within an area defined by black, undestroyed houses there was the familiar pink carpet, about two miles in diameter. What is more, precisely as in Yokohama, Osaka, or Kobe, it was dotted with buildings still standing erect, with charred trees, poles, and other objects. All but one of the steel and concrete bridges were intact. A cluster of modern concrete buildings in the downtown section stood upright and seemingly undamaged.

How strange, I thought, that in their concentration on the spectacle of damage observers should have overlooked the telltale evidence of structural survival!

On inspecting the scene on the ground, what I found was essentially a quite typical burned-out city. I knew what the blast of a five- or six-ton bomb could do to near-by buildings. It was apparent at once from the appearance of Hiroshima that, powerful as the atomic blast had been, it was not an “apocalyptic” force but an explosion of finite proportions.

The blast had affected an extensive area. But it had not been powerful enough to demolish the modern concrete buildings within a block from “ground zero”—the point over which the bomb was ex-



HIROSHIMA AFTER THE ATOMIC BOMB EXPLODED: Above—As seen from the air: (A) “T” Bridge, the aiming point, remained intact, except for damaged railings; (B) “ground zero,” the point over which the bomb actually exploded.

*Below—A cluster of concrete office buildings, standing erect and structurally intact amidst the ashes of the surrounding wooden houses, near “ground zero” (B).*



*All photographs in this section, not otherwise credited, are by the author.*



Two examples, typical of hundreds of sensational photographs published throughout the world, purporting to show "what is left of Hiroshima." By failing to indicate that some types of structure survived, they encouraged the early "atomic hysteria."







THE KIND OF PICTURES THAT WERE SELDOM PUBLISHED: Taken by the author six weeks after the explosion, they show modern buildings that remained standing. *Above*—The main street of Hiroshima. *Below*—The downtown section seen from the river; these concrete structures were directly under the explosion point.





*Above*—An intersection of two main streets close to “ground zero.” Electric trolley service was fully restored throughout Hiroshima within 48 hours.

*Below*—In these primitive hillside shelters, practically at “ground zero,” inhabitants of Nagasaki were unharmed by atomic blast, heat, and radiation.







*Above*—The author at “ground zero” in Nagasaki. The surviving tree trunks in the background refute reports of “evaporation” and “dissolution” of matter.

*Below*—This house is typical of the flimsy wooden structures, with top-heavy tile roofs, that made Hiroshima and Nagasaki so extremely vulnerable to atomic blast and fire.





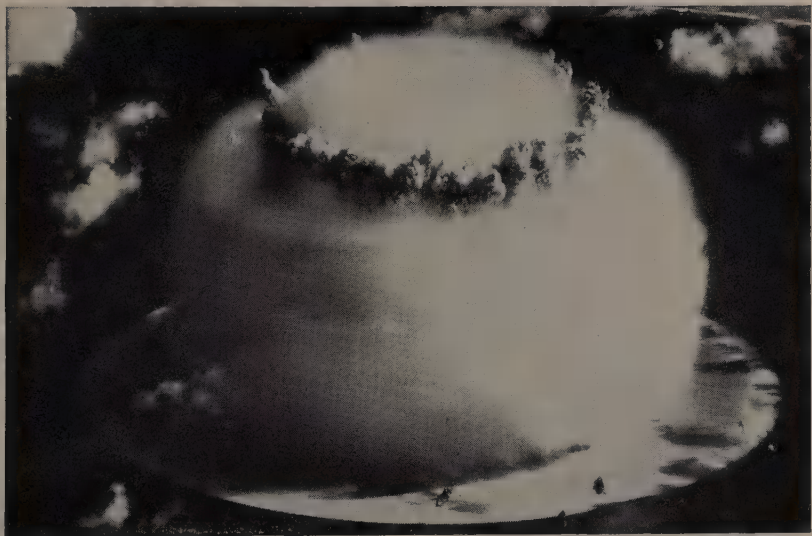
A STUDY IN VULNERABILITY: *Above*—A typical narrow Japanese street. After the houses collapsed from blast, such streets were completely clogged and inaccessible to fire-fighters, turning an entire city into a flaming mass of kindling wood. *Below*—This is non-atomic devastation, a section of Berlin demolished by TNT bombs. The horror of Hiroshima was actually exceeded in many German cities, and it was no consolation to the inhabitants that this was done by “old-fashioned” bombs.





*Wide World*

THE PATTERN OF ATOMIC EXPLOSION AT BIKINI: *Left*—In this aerial blast, contaminated particles of fissionable material were carried upward, with no residual radioactivity on the surface. *Below*—*Underwater* explosion, in which the particles, mixed with water, drenched the targets and left considerable radioactivity.



*Wide World*





*Dept. of Defense photo*

THE "HOTTEST TARGET": The aircraft carrier *Independence*, after the Bikini tests. Its extreme mutilation, the author believes after inspecting it, was due primarily to explosion of its volatile vitals (munitions, torpedoes, etc.) by bomb-ignited fires. This is the usual fate of carriers suffering direct hits by ordinary bombs. Though the *Independence* is often cited as Exhibit A of contamination, it should be remembered that it was already in its mutilated state (result of the *aerial* blast) when placed in the target area of the *underwater* explosion. Thus huge quantities of "poisoned" water were trapped in crevices of the twisted wreckage, making decontamination virtually impossible.

*Below*—General Douglas MacArthur and Major de Seversky, in Tokyo, October, 1945, during the author's inspection tour of the Pacific theater for Secretary of War Patterson.



ploded. Closer inspection of the buildings, of course, revealed terrific damage by fire and the effects of blast on windows and on flimsy partitions within the buildings. Aside from that, however, the structures did not look any different from those in other towns subjected to incendiary-bomb attacks.

I had heard about buildings instantly consumed by unprecedented heat. Yet here were buildings structurally intact, with outside plaster and stone facings in place. What is more, I found them topped by undamaged flag poles, lightning rods, painted railings, air-raid sirens, and other fragile objects. Clearly they had weathered the blast and somehow escaped the infernal heat, as well as the alleged super-hurricane thousand-mile-an-hour wind.

For two days I examined Hiroshima. I drove to T Bridge, which had been the aiming point for the atomic bomb. In its environs I looked for the bald spot where everything presumably had been vaporized or boiled to dust in the twinkling of an eye. It wasn't there or anywhere else in the city. I searched for other traces of phenomena that could reasonably be tagged "unusual." I couldn't find them.

What I did see was in substance a replica of Yokohama, Osaka, or the Tokyo suburbs: the familiar residue of an area of wood and brick houses razed by uncontrolled fire. Everywhere I saw the trunks of charred and leafless trees, burned and unburned chunks of wood, rubbish heaps left by unchecked conflagration. Obviously there had been fire here, as in other Japanese cities, intense enough to bend and twist steel girders and to melt glass until it ran like lava.

I studied with particular attention the concrete buildings nearest to ground zero. Some of them, only a few blocks from the heart of the atom blast, showed no structural damage, but merely the typical effects of fire. Window glass was shattered, of course, but single-panel frames held firmly. Only window frames of two or more panels were bent and buckled. This was a picture no different from the one presented by thousands of buildings I had seen in Europe and Japan subjected to the blast of ordinary, high-explosive bombs.

The blast effect was remarkable, considering the total area affected by *one* bomb, but did not appear phenomenal in its effects upon individual structures and other targets. Nor did I find startling evidence of heat beyond what is normally generated in a city in flames with-

out benefit of the atomic bomb. Here and there I detected a charring of objects that could be ascribed to the flash heat of the explosion. Scientifically this was a very interesting and unusual phenomenon—the application of intense heat for an extremely brief period. But practically the incendiary properties of the explosive did not seem especially devastating.

The United States Strategic Bombing Survey subsequently reported third-degree burns on human bodies as far as a mile from the point of explosion. On the other hand, I saw highly inflammable objects right at ground zero that had not been ignited. The Survey report noted bodies charred beyond recognition in the vicinity of ground zero. But there were also tens of thousands of bodies, scattered all over the city, no less charred as a result of ordinary fire.

As in any bombed city, many of the victims were killed—theoretically—three times: by blast, by falling debris, and by fire. In Hiroshima people could have been killed four times over, since we can add death from radiation at the moment of explosion.

I questioned a great many survivors who had been inside concrete buildings when the bomb exploded. In particular I talked to occupants of the ten-story Hiroshima Press building, located about three blocks from ground zero. Their accounts paralleled scores of descriptions I heard from people in concrete buildings in areas hit by block-busters in Germany and in other parts of Japan. They revealed no special effects that could be identified as unusual and ascribed specifically to the atom bomb. The Press building, like other such structures, was badly gutted by fire but otherwise structurally unhurt, except of course for loss of glass and some interior partitions. Most of its population at the time of the explosion survived.

People caught in the building did not observe any exceptional phenomena. They saw a flash, heard an explosion, and shortly thereafter fire broke out on the fourth floor, where inflammable negatives and motion picture films were stored, and the fire spread to other floors. Some of the tenants claimed that the fire started simultaneously with the bomb flash; others insisted that it spread from the adjoining movie theater, which had collapsed and was in flames.

The Hiroshima hospital, about a mile from the explosion center, had most of its window panels blown out. Because it was too far



away to be affected by flash heat and because there were no wooden houses in the vicinity, it escaped fire. The people inside the hospital building were not affected by radiation, but suffered from falling ceiling plaster and flying glass. In general, the effects here were analogous to those produced by blast of TNT bombs.

The more I looked, the more I questioned survivors, the more I became convinced that the world had obtained an essentially erroneous impression of what had occurred in Hiroshima.

Death and destruction were as great as reported. The horror was as profound as reported. But, except for the effects of radioactivity (the least of the elements in accounting for the aggregate death and destruction), *the character of the damage* was in no sense unique. Neither the blast nor the heat had produced effects as phenomenal as generally assumed. Most important, there was clear proof that the same bomb applied to a different type of target would have produced quite different results.

From Hiroshima I flew to Nagasaki. I repeated the process of investigation and cross-examination. It added little to what I had already learned in the other city.

The pink carpet was much smaller. It was also studded with concrete buildings gutted by fire. Fewer of these buildings were in evidence only because there were not so many modern structures in that city. Though the bomb was reported to have been more powerful than the one dropped on Hiroshima, the loss of life was smaller, not only absolutely but in proportion to the population.

All of downtown Nagasaki, though chiefly wooden in construction, survived virtually undamaged. Part of this unaffected section, it was explained, had apparently been shielded from the explosive blast by intervening hills. But the rest of the section lies down the river in a straight and quite unimpeded line from ground zero, yet it escaped serious damage. Only a few of its houses caved in. We must assume that the Nagasaki blast expended itself before it reached this area. *Because the houses did not collapse here, there was no general fire.*

From the published data, my personal observations of the two cities, and the experience gained subsequently at Bikini, let me recapitulate what actually happened in Hiroshima. In essence it holds good for Nagasaki as well.

THE HIROSHIMA BOMB, we may deduce from the shadows of flash burns, exploded about two thousand feet above the surface. Its great blast acted like a huge flyswatter two miles square. It slapped down on a city of flimsy wooden houses and rickety brick buildings, flattening them out in one mighty blow and burying perhaps a hundred and fifty thousand inhabitants in the debris.

One must see to believe the flimsiness of average Japanese wooden structures, many of them termite-eaten and dry-rotted for generations. To make things worse they are top-heavy with thick tile roofs, used to protect them from sparks, should neighboring houses catch fire. Sometimes houses tumble down without apparent reason, expiring, as it were, of sheer old age. I nearly crumbled one myself in Nagasaki when I accidentally kicked a wall with my artificial leg.

When the houses collapsed under the bomb impact, the wooden slats of the frame structures were piled like so much kindling in your fireplace. Judging by the Los Alamos test, so-called primary fires—ignited by the heat of the explosion—should have taken place near ground zero. But the direct incendiary properties of the bomb as exploded in Hiroshima were insignificant in comparison with the conflagration that broke out simultaneously in thousands of spots over a wide area through short circuits, overturned charcoal braziers, and broken gas mains.

Had there been no universal collapse of the highly inflammable houses, the primary fires ignited by the bomb itself might have been brought under control. But the whole area under the giant flyswatter exploded into one fantastic bonfire, as normally happens after a major incendiary raid. Those concrete buildings that were surrounded by wooden structures, and thus caught in the heart of the bonfire, were naturally also enveloped in flames.

In normal fires, in buildings that remain erect, people have a chance to escape. Some parts burn before others. They can run from one floor to another, from room to room, and have a chance to find sanctuary in the streets and other open spaces. The streets are not yet cluttered with debris, so that people can run to the rivers or to unaffected parts of the city before the structures crumble.

Hiroshima provided no such escape. All the fragile structures collapsed and thousands of fires broke out simultaneously. Most of the inmates were helplessly trapped. With few exceptions, the streets were extremely narrow, an average of thirty feet in width. Falling houses filled and clogged them instantaneously. The entire area turned into one solid, continuous mass of flames without channels for escape.

Thousands of people must have been killed outright by falling roofs and walls. The rest were crippled and immobilized in a burning hell. Those who managed somehow to extricate themselves rushed toward the bridges and the rivers.

There is reason to deduce that the one steel bridge that collapsed gave way under the weight of the frenzied mob and not, as some maintained, because of the bomb blast. On the other bridges, the crush of hysterical humanity pushed down railings, catapulting thousands to their death by drowning.

*On a vast and horrifying scale, it was fire, pure and simple, that took such high toll of life and property in Hiroshima, and in Nagasaki as well.*

As for the effects of radiation, according to Colonel Stafford Warren of the Strategic Bombing Survey, "Our best guess is that if there had been no gamma radiation, the total casualties would have been five to seven per cent less. In other words, the gamma radiation and allied radiation effects did not add a great deal to what would have happened if the same amount of energy had been released by TNT." \* In Hiroshima this would mean that from four thousand to five thousand people were killed by radioactivity, and in Nagasaki from two thousand to twenty-five hundred.

If the same number of people had been subjected to a similar attack in a modern stone-and-concrete city, those inside buildings would have been shielded against the gamma rays, except where they were exposed by windows. Supposing that as many as half the population in the attacked area were in the open, the Hiroshima figure for radiation deaths would have been cut to twenty-five hundred. Even these, however, would be moving among tall buildings and therefore protected by masonry, so that only about one-third of them

\* Volume 15, U.S. Senate Report of Proceedings, before Special Committee on Atomic Energy.

would have been exposed to direct gamma rays, thus reducing the radiation death toll to some eight hundred or one thousand.

This assumes a condition of total surprise such as Hiroshima faced. Though an alert had been sounded, the people saw only one plane approaching and made no effort to take cover. If warned in time and aware of the consequences of atomic attack, people would rush to shelters and huddle in the interior of buildings; they would avoid windows and other exposed places. A large number would succeed in taking refuge in basements, tunnels, subways. With multiple barriers of brick, stone, and concrete between themselves and the bomb-flash, we could expect only a few hundred casualties from direct radioactivity at the moment of explosion.

Some people are deeply convinced that the magnitude of the death record in the atom-bombed cities was due to radioactivity. No amount of sober logic will dissuade them. Of the three-in-one properties of the new bomb—blast, fire heat, and poison rays—radioactivity is the unfamiliar element and consequently the most terrifying psychologically. Yet in an air burst it is the least of the three threats and the one, besides, that can be most easily evaded, given an interval of warning.

The greatest damage, I repeat, was caused by fire—fire on the same devastating scale as in other large Japanese and German cities. The loss of life was much greater only because of the exceptionally inflammable target; because the simultaneous caving in of so many homes cut off roads of escape.

A combined demolition and incendiary attack on Hamburg by some seven hundred British aircraft at the end of July, 1943, brought death and destruction on a greater scale than in atomized Hiroshima and Nagasaki. A secret German document described the havoc as "beyond all human imagination." Small fires, it declared, "united into conflagrations in the shortest time and these in turn led to fire storms. To comprehend these . . . one can only analyze them from a physical, meteorological angle . . . a fire typhoon such as was never before witnessed, against which every human resistance was quite useless." The suction of the overheated air was strong enough to pull trees out of the ground. "To judge from the German description of it," Marshal Harris of the R.A.F. has written, the disaster "must have

been even more cataclysmic than the bursting of the two atom bombs over Japanese cities." \*

In the mass incendiary-demolition attack on Tokyo on March 9-10, 1945, an area nearly four times as large as Hiroshima's was destroyed: 15.8 square miles against 4.7 square miles. The density of population was almost three times as great. But only 83,000 were killed or missing. The casualties were thus, percentage-wise, about one-twelfth as serious as in Hiroshima.

It is too easy, under the psychological influence of the atom-bomb novelty, to ascribe the greater losses to the direct and primary action of the new explosive. Actually, the smaller cost in life in Tokyo was due to the kind of bombing we directed against that city.

Its purpose was not to kill people but to destroy property, the means of waging war. Had we chosen to kill more people, we would have mixed a larger proportion of high explosives with the incendiaries. In Tokyo, too, the population would then have been trapped by collapsing buildings with a corresponding increase in deaths. The normal incendiary ignites a structure without collapsing it, enabling more people to escape. Besides, Tokyo had a far larger proportion of non-inflammable houses than Hiroshima and these served as shelters against the conflagration.

*An atom-bomb explosion in a modern city, even if no shelters were provided and no advance alerts sounded, could not conceivably do damage on the Hiroshima-Nagasaki scale.* Incendiary, blast, and radiation casualties would be only a small fraction of the Japanese figures.

Dr. Charles U. Kring, a member of the U.S. Strategic Bombing Survey, in general confirms this view, on the basis of voluminous research by a large staff of experts. He has stated that "a Western city which had been alerted in sufficient time for people to take refuge in basements and bottom floors of multistory frame buildings, in tunnels and deep subways, would probably suffer only a few thousand casualties."

Dr. R. E. Lapp, a physicist and a member of the Manhattan Project, in visualizing an atomic burst over Manhattan, in his book *Must We Hide?* wrote: "Directly under the center of the blast, people in the \* *Bomber Offensive*, by Sir Arthur Harris; Collins, 1947, page 174.



subways would be unaffected either by the blast or by the radiation. They would be perfectly safe." People farther from the center of the blast, he added, would also be safe "if they were in the lower floors of buildings shielded from the flash of radiation." \*

Would there be any serious lingering or residual radioactivity? I believe that the answer is no. It has been claimed that faintly discernible pockets of radioactivity were detected in Hiroshima and Nagasaki, but they were too weak to affect human beings. According to the Bombing Survey, measurements taken at Takatsu, at a spot 10,000 feet from ground zero in Hiroshima, and at Nishiyama, 6,500 feet from ground zero in Nagasaki, showed traces of radioactivity, but not in appreciable strength. One explanation for the residual radioactivity that was noted in the Japanese cities is that heavy rain fell shortly after detonation of the atomic bombs. "Infected" fissionable particles were presumably brought down by the rain and deposited in the earth's surface.

Rescue workers and the Red Cross entered the bombed areas immediately and worked without ill effects. The radioactive danger existed only at the moment of explosion, which is an infinitesimal fraction of a second, and affected only those who were directly exposed to the rays.

The confusion on this score has been caused in part by the results of underwater explosion of the atom bomb at Bikini. This bomb was artificially planted under water and detonated by remote control, as a kind of laboratory experiment. Millions of tons of water were mixed with radioactive fissionable material. This "poisoned" water drenched the ships, leaving radioactive particles in all the crevices of the structures, from which they could not be completely removed without dismantling the ships. Hence they had to be scrapped. This condition does not prevail in aerial attacks over land.

And as a practical matter, what difference does it make whether a given section is so contaminated atomically that it has to be roped off, or so pulverized by ordinary bombing that it is inaccessible and useless? In both cases it is eliminated. Indeed, a demolished area would be "out" for good unless it were rebuilt, whereas the same area contaminated would be useless only until the radioactivity subsided. If

\* Addison-Wesley, 1949, page 84.

the section contained objects of great value, such as the Louvre or the Metropolitan Museum of Art, demolition would inflict irreplaceable loss as against the temporary inconvenience imposed by contamination. Come to think of it, if we knew how to contaminate for the duration the enemy's entire industrial setup and war-making means, it would be the most humane way to win a war.

The original explosion of the bomb in New Mexico, having been detonated closer to the ground than in either of the Japanese explosions, netted important information. When we explode the bomb immediately over the earth's surface, it is likely that the heat will then be intensive enough to evaporate matter in the immediate vicinity; that this area would be radioactive for some time; that some structures at ground zero would be pulverized by the gigantic blasts.

On the other hand, the damage would be sharply localized. The results would be more intensive, less extensive. Destruction would not be so widespread and the loss of life would shrink proportionately. The level at which an atomic bomb should be detonated therefore depends, as in the case of ordinary bombs, on the target and the results desired.

Detonation about two thousand feet in the air was perfect calculation for the two doomed Japanese cities, if the purpose was to demonstrate maximum destruction and loss of life. The flimsiness of the targets guaranteed the largest possible damage through blast and fire. For the most destructive results in a steel-and-concrete city, detonation will be required much closer to the surface—in which case the area affected would be drastically reduced.

The blasts were strong enough to collapse four square miles of fragile houses, but too weak to raze reinforced concrete buildings even at the focal centers of explosion. The fault, as I see it, with most of the official appraisals of the atomic damage, including the U.S. Strategic Bombing Survey, is this: they emphasize the impressive distance at which some houses were collapsed, but they fail to underscore the no less impressive survival of buildings and even fragile objects close to the point of explosion.

It simply is not true that eighty thousand lives were snuffed out in Hiroshima and forty thousand in Nagasaki in the fraction of a second. The great majority of victims died slowly, from suffocation and fire.

It simply is not true that matter was "evaporated" by the heat. If steel had evaporated, certainly wood could not have survived, as it did survive everywhere.

In neither of the bombed cities was there a bald spot denuded of all inflammables such as was created in the New Mexico experiment. People who happened to be in the crude hillside caves that served as local shelters were immune; those who were shielded by masonry suffered very few casualties.

Damage to underground installations such as telephone and electric lines and sewer systems was extremely slight, except where they had been wrecked by the weight of falling objects. Within twenty-four hours after the historic explosion, electric power was restored in undamaged sections and buildings in Hiroshima; within forty-eight hours trolley cars were running through the heart of the bombed section.

Machinery in industrial plants in atomized areas was only slightly affected. So far as its machines were concerned, the big Mitsubishi factory in Nagasaki, for example, could have been put back in operation in a couple of months. Rather more serious damage, in fact, had been done a week earlier by direct hits with half-ton TNT bombs by George Kenney's Air Force. In fireproof buildings the atomic effects were pretty much like those of light bombs in contact detonation: the structures were damaged but not the machinery within.

Such were the facts as I found them in Hiroshima and Nagasaki. They seemed to me dismal enough without pseudo-scientific trimmings and exaggerations and imaginative assumptions.

## ATOMIC HYSTERIA AND COMMON SENSE

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THE STORY sketched in the preceding chapter obviously was different from the one then being told virtually in unison by press, radio, and scientists. Against the prevailing hyperbole it must have sounded more incredible than I suspected. But it was the only story I could conscientiously tell when I was questioned by newspapermen in Tokyo and back home in America.

I did not "underrate" the atom bomb or dispute its future potential. Certainly I did not dismiss lightly the infernal horror visited on Hiroshima and Nagasaki. As an engineer, I limited myself to an analysis of the demolition accomplished by particular bombs exploded in a particular way. These one-man observations I embodied in a formal report to the Secretary of War, who released it to the public. In addition I wrote several articles on the subject.

Whereupon all hell broke loose over my sinful head. My findings were pounced upon by all sorts of people in angry fury, on the air, in the press, at public forums; scientists who hadn't been within five thousand miles of the atomized cities solemnly issued condemnations of my heretical views. Almost for the first time in my career I found myself in the position of a "conservative" under fire from "extremists."

It seemed to me an exceedingly strange phenomenon, this eagerness of people to protect the original exaggerated version. How did it happen that so many people had acquired a sort of vested interest in misrepresentation of the facts? Why did they defend the myth with such fervor?

It should be noted that my impressions have been confirmed, in substance if not in detail, by official and expert examination. On June 30, 1946, about six months after my first report, the findings of the

United States Strategic Bombing Survey were made public. They represented months of research by about three hundred specialists, assisted by hundreds of military and other personnel. To a surprisingly great extent the elaborate investigation corroborated deductions I had based on a brief study.

Let me cite a specific example. I had declared that two hundred B-29 bombers, loaded with incendiaries and high explosives, could have duplicated the damage wrought in Hiroshima or Nagasaki by a single atom bomb. A group of University of Chicago professors singled out this conclusion for special derision. Then I spent a grueling day on February 15, 1946, before the Senate Special Committee on Atomic Energy defending my estimate. Senator Brien MacMahon, as committee chairman, confronted me with a statement by a British ordnance expert, Major General J. R. C. Fuller, asserting that the destructive power of an American bomber had been multiplied "about three thousand times" by the atom bomb. General Thomas F. Farrell, second in command of the exploding of the two bombs over Japan, testified more modestly that "it would take 730 B-29's to do what one atomic bomb did to Hiroshima."

Four and a half months later the Bombing Survey issued its formal verdict: "*With each plane carrying ten tons, the attacking force required would have been 210 B-29's at Hiroshima and 120 B-29's at Nagasaki*" to accomplish the same amount of destruction.

Subsequently the U.S. delegation to the United Nations Atomic Energy Commission estimated that one atom bomb of the type dropped on Japan is equivalent to 167 ten-ton blockbusters. Since the blockbuster contains only about five tons of TNT, this estimate really asserted that one bomb equals 835 tons of TNT. Yet the energy released by the bomb was generally computed as equivalent to 20,000 tons of high explosives. The disparity between 20,000 and 835 is the difference between the total energy released and its "useful" tactical values. A lot of the misconceptions in the public mind are explained by this ratio.

Even official verdicts and estimates, however, did not suffice to down the original exaggerations. Scarcely a week passes but some writer or commentator repeats that I have "discounted" the atom bomb. I have before me a clipping containing an offhand reference



to "Seversky's contention that the atom bomb is a dud"! Apparently there is a strange reluctance to differentiate between the admitted destructiveness of the bomb and its rightful place in the strategic scheme of things.

In *One World or None*, Professor Philip Morrison of Cornell insisted that "a single bomb can saturate a city the size of Indianapolis, or a whole district of a great city like lower Manhattan . . ." with a death toll of about 300,000. I have no way of knowing whether he risked that swollen estimate before or after the Bombing Survey report was published, but he had been in Hiroshima and should have known better.

In an imaginative preview of what a single bomb would do to New York, the Professor may have been taking an imaginative revenge on me. Among those who in his fantasy died from the delayed effects of radiation there was a "well-known aeronautical engineer" and he died "while working on a report on the extent of the damage to steel structures" in that bombing. In the face of my promised doom I still repeat that neither 167 blockbusters nor the bombing power of 210 B-29s—equivalents of a single atom bomb—would cause the amount of devastation he describes for New York, Indianapolis, or any other modern town.

"The atomic bomb is not a bomb," General Thomas F. Farrell exclaimed in type. "It is a catastrophe, a world upheaval, a deluge, a debacle, and a disaster rolled into one." In a daring magazine forecast of what the bomb would do to ships off Bikini, the same gentleman foresaw effects—and a flamboyant artist translated his visions into drawings—which were about as wrong as they could be. As if the reality were not sufficiently harrowing, there was and there remains this straining to outdo reality.

"The atomic bomb," wrote William L. Laurence, science writer for the *New York Times*, "is not just another weapon against which our military minds will find a defense, but the greatest cataclysmic force ever released on earth." Unless it is forthwith controlled, he said, "it will inevitably lead to the destruction of civilization." He was not the only one writing off civilization and dealing in inevitabilities just then. The bomb seemed to have touched off a prophetic wave.

In time, as was to be expected, more restrained voices began to

make themselves heard through the din. Estimates of damage per bomb were scaled down. The early headlines about one bomb wiping out one metropolis evolved into "Six Atom Bombs Could Wipe Out New York" (New York *Mirror*, January 18, 1948), then eight, then fifteen. The hysteria generated around radioactivity subsided, as a number of specialists reduced the wild generalizations to manageable fact. Here and there people even warned that the fear of radioactivity might do more harm than radioactivity itself.

One after another, military commentators climbed off the limb with statements that the atom bomb, after all, was not the "absolute weapon." The absurd notion that it was an all-purpose bomb was abandoned, with a growing realization that the bomb was suitable and economic only against specific types of targets. Rear Admiral William Sterling Parsons in an Associated Press interview declared that there had been "tremendous overemphasis of the atom bomb." Colonel James P. Cooney, an Army observer at Bikini, said that "un-reasoning psychological fears" of the effects of gamma rays "could well interfere with an important military mission in time of war."

The tall tales of lush vegetation in Hiroshima were debunked and those visions of cucumbers like skyscrapers and hydra-headed onions on atom-infected ground faded out. Said Science Service on the basis of data from David Lilienthal: "Reports of enormous increases in vegetables obtained on Hiroshima's bomb-blasted soil by a Japanese truck farmer were true enough . . . only the farmer had used five times as much fertilizer as his neighbors—which may have had something to do with the results."

Bikini, we had been assured, could never be decontaminated and would never again be suitable for normal animal or plant life. But one year after the big blasts investigators could report that animal, vegetable, and marine life was normal and as ample as before the tests. The Hiroshima and Nagasaki areas, it had been expected by many people, would be uninhabitable for eighty years; the estimate proved wrong by approximately eighty years.

THERE seems to have been a conspiracy of circumstances to whip up atomic hysteria.

To begin with, Emperor Hirohito, his court, the Japanese military clique, their press and radio had obvious reasons for propagating the most extreme version possible of the atom-bombing effects. *It gave them the perfect face-saving excuse for surrender.* The more devastating, the more nearly "supernatural," the new weapon, the more justification for calling off resistance.

The Mikado's court, as was generally known, had been eager to make peace long before the atomic offensive, but was opposed by the military clique. Didn't they have six or seven million armed and able men at their disposal? The military chiefs looked forward with some hope to the "decisive battles" on the ground in Manchuria and the home islands. Their whole education, like the education of their opposite numbers in the Allied camp, made them certain that the war could not end while powerful armies were still intact.

The American atomic blows dramatically swung the balance to the Mikado's side. Even the generals could now pretend, to themselves and to the population, that they were not to blame for the defeat; that a new, almost magical force had intervened to explode their otherwise correct calculations.

Court and generals alike, indeed, could throw the onus for defeat on the people. Not any paucity of valor, wisdom, and military genius on the part of the leaders, but technological retardation on the part of the Japanese people as a whole explained the humiliation.

The truth, of course, is that Japan was already a defeated and helpless country. Hirohito and his associates groped for an exit that would allow them to salvage a few shreds of dignity and prestige. The atomic demolition of Hiroshima and Nagasaki was welcome, in that it "explained" their failure in the most expeditious and impressive fashion. After the surrender I had the chance to interview Emperor Hirohito and high-ranking members of his household. I also interrogated Rear Admiral Takata of the Imperial Japanese Navy; Lieutenant General Kawabe, commanding at Kokosogan; Major General Miwa; Lieutenant General Saburo Endo, who was in charge of aircraft and engine production for the entire Japanese Empire; Lieutenant General Samo, commandant of the Osaka Arsenal; and many key leaders of industry. My impression, as summarized above, was strengthened.

It must be acknowledged that the bomb provided a no less provi-

dential face-saver and conscience-pacifier for the American military leadership. Having failed to comprehend the decisive role of air power, we were deeply and expensively committed to colossal invasion plans. Every attempt to prove that a nation can be defeated by the direct application of air power to its industrial vitals had been brushed off by our high command. Having insisted so loudly that there could be no victory without coming to grips with the Nipponese surface forces in the traditional bayonet struggle, they were practically forced to finish the conflict in that way.

Accordingly, a free gift of Manchuria was made to Stalin for his promised use of the Red Army on the Asiatic mainland. Accordingly, the storming of the Japanese homeland by vast invading forces was set, dates fixed, gigantic resources deployed. The bloody battle of Okinawa had been fought strictly as a preliminary action looking to invasion.

Although to all airmen and many people in the other services it was sufficiently evident that Japan was being knocked out by air power, the momentum of the old assumptions was too great to be arrested. We would undoubtedly have gone through with the invasion plans as scheduled and paid a tragic price in life. Came the atom bomb! Instantly it released everybody from past commitments and psychological fixations. Old-style leaders could assure themselves, in all honesty, that they had been perfectly right in their strategic concepts until a new, unforeseen element amounting to an act of God had intervened.

Now they could gracefully, without sacrifice of prestige, accept surrender without the formality of invasion or a mile-by-mile bayonet struggle. Six million Japanese were still under arms. The exorbitant price exacted by the Kremlin for its help was a dead loss. But there was "science" as an alibi. It wasn't air power that did the trick but a new and unpredictable force limitless in potency. The more extreme the picture of the atomic effects, the more hysterical the mood induced in an awe-struck world, the more clinching the explanation for an unorthodox victory.

Our high command, like its Japanese counterpart, could pretend that there had been no surrender approaches. They could overlook the circumstance that Japan was already beaten. The very fact that it was

possible for a single airplane to deliver the atom bomb in broad daylight without molestation was proof that opposing air power had been eliminated, giving us absolute freedom of navigation in the Japanese skies.

Air power, in the phrase of a great many military and scientific leaders, had been "superseded by atomic power." The Hiroshima and Nagasaki episodes added less than three per cent to the aerial devastation already rained on Japan. With the country helpless under skies controlled by the enemy, total annihilation had resolved into a mere trucking job. Had the atom bomb remained a secret for the future, the actual physical picture would have been no different. But the psychological picture was another matter. We now had a face-saving miracle which spared perhaps a million American and Japanese lives.

Thus both sides were equally eager to depict the Hiroshima and Nagasaki events in the most flamboyant colors.

There were, besides, other powerful motives in the dramatization of the atom bomb. Somehow it fitted nicely into the propaganda patterns and wishful-thinking of a great many different groups. For isolationists it offered the final proof that we could let the rest of the world stew in its own juices; with the miracle weapon in our sole possession and a head start in its further development, who would dare challenge us? Internationalists and ardent proponents of a world order exclaimed that there would no longer be victors in future wars, but only mutual extermination, the end of civilization; hence there was no alternative but to abolish nations and frontiers.

Moreover, as tension between the Soviet Union and its democratic allies mounted, atomic hysteria was turned into a useful propaganda weapon for partisans of the Soviets in our midst. War, they argued, had now become so destructive that no price in principle or in territory was too great to head it off. There were a few voices which suggested that "no world" was preferable to "one world" on Moscow's terms, but they were drowned out by the new pacifism.

Perhaps it was not accidental that so many of the panic-mongers on the atomic issue, writers and physicists, were pro-Soviet in their political bias. Now they had a scientific and humanitarian basis for urging appeasement of the Kremlin, and disarmament. The art of war



having allegedly been blasted out of existence, what was the use of maintaining a costly national security setup?

This does not mean that I take exception to their estimates of the horror of atomic warfare. Had they been able to impress all mankind, and in particular the portion behind Stalin's iron curtain, their dire prophecies of universal dissolution might have served to scare the world into peace. Unfortunately their grim propaganda could reach only the free peoples, thus inducing a mood of despair which Moscow exploited to extend and consolidate its postwar conquests. Stalin, be it noted, hasn't been scaring his subjects with the atom bomb.

Later the Soviet-inspired propaganda around the atom bomb was reversed. The "pacifist" drive had failed, except insofar as it delayed American rearmament. The democracies were forging defensive pacts and restoring military vitality as fast as they could. It served Moscow's purposes therefore to dismiss the bomb as ineffective in modern war. What the new "line" will be now that the U.S.S.R. is presumably building up its own atomic stockpile remains to be seen.

There has also been a curious change of party line in American naval circles. At first the admirals joined the general chorus of atomic exaggeration. They merely insisted that ships and aircraft carriers were the best means of delivering the new bomb; the supercarrier was projected as the special instrument for this purpose. But when it became fairly clear that atomic warfare was being accepted by the government as a function of air power, the admirals made a hairpin turn of opinion. They now discovered that the atomic explosive was not "what it was cracked up to be" and that its use, moreover, was immoral. Their testimony on this score before the House Committee in October, 1949, makes amusing reading when compared with naval opinion a few years earlier.

In many quarters hysteria continued to grow. What is, for all its fearsome potency, a finite instrument was raised to an apocryphal and limitless dimension. What is in essence a new explosive—an "efficient" piece of ordnance—was promoted to the status of a new military force. What is basically an improved weapon of air power was accepted as a substitute for air power.

The truth is that Berlin, Dresden, Cologne, Hamburg, Bremen, and a great many other German cities suffered as grievously and on as

great a scale as Hiroshima and Nagasaki. Both the human and property loss was as vast, the sum-total of suffering no less terrifying. To the victims it was small consolation that their tragedy was accomplished by TNT rather than by atomic explosives. To the crippled, homeless, and miserable victims it made little enough difference whether they were hit by one atomic bomb or by hundreds of conventional bombs.

John Hersey wrote a terrifying description of atomized Hiroshima which shocked the American reading public. Yet there was little, if anything, he reported from the Japanese city that he could not have found in any of the great bombed-out cities in Germany or some Japanese cities razed by blockbusters and incendiaries. *The New Yorker*, I fear, unwittingly did a disservice to American thought in devoting an entire issue to the Hersey story. It reinforced the fallacious notion that horror is a special attribute of the atom bomb, rather than of modern war generally.

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"IF A RAID of only two hundred Superforts with ordinary explosives can wipe out Hiroshima as the atomic bomb did, these same two hundred Superforts using atomic bombs could, in a single raid, wipe out two hundred cities with a population of about three hundred thousand each."

This profound comment on my estimate of atomic destruction in Japan was made in a broadcast by Chicago University professors. Perhaps because of their academic background, they assumed perfect laboratory conditions, merely neglecting to specify two real-life conditions: (1) The doomed two hundred cities should be as flimsy and dry-rotted and primitive as Hiroshima; and (2) the attackers should enjoy unimpeded right of way to the two hundred targets; or, to put it more concretely, the atom-bombing should come after the adversary's air power has been totally defeated.

Scientists who reckon that one atom bomb will wipe out one major modern city are venturing beyond their depth. With the valor of their military innocence they figure out the number of cities to be destroyed to knock out a given nation, assume a bomb stockpile of the same number, and imagine they are solving strategic problems. Their as-

sumption is that under all conditions the bomb-bearing airplanes will reach their goal and that the score of hits will be one hundred per cent. Which does simplify matters considerably.

People forget that even in gunfire target practice under peacetime conditions the average score is fifty per cent, though some exceptional records of ninety per cent or more hits have been made. But the same men under battle conditions rarely exceed three per cent.

When we begin to speculate about the number of atom bombs that would be required to destroy a Detroit or a New York we must take into consideration the difficulties of penetration, the nature of the defenses, the best accuracy attainable under desperate combat conditions. In the light of experience, and of new scientific defense measures already in the offing, an enemy would probably have to fly a hundred and fifty bombs in the direction of New York in the hope of scoring ten or fifteen direct hits, the least that would be required to put that metropolis out of commission.

A bomb today costs millions of dollars. Though production costs will be reduced in time, they will still be enormously expensive in terms of labor and materials. The interception of ordinary bombs in transit was no tragedy; the interception of an atom-bearing plane would wipe out a real chunk of the attacker's national wealth. We might find the aggregate cost and effort economically prohibitive—that the same aeronautical effort put into conventional bombs would eliminate the same target at a great deal less cost. In the last war bombs were so cheap that in considering the cost of an operation we reckoned only crews and planes. In an atomic operation we shall have to consider crews, planes, *and bombs*.

This consideration of costs is rarely touched upon by atomic enthusiasts. Yet in a war of attrition it may well become a central factor. If we relied on atom bombs only to defeat an enemy as large as Soviet Russia, so much of our economy, so much of our available manpower and raw materials would have to be invested in bombs that not enough would be left for the massive and invincible air power we would need to assume control of the skies so that those bombs could be delivered.

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*Reference to atomic destruction is meaningless until it is related to specific targets.* The likely effects on one type of objective do not necessarily correspond to the effects on other types.

One atom bomb of the kind dropped on Hiroshima—or two hundred B-29's loaded with TNT and incendiaries—could destroy four square miles of a target as inflammable as Hiroshima. As we have noted, it could not conceivably produce comparable results in a steel-and-concrete city. For one thing, the bomb would have to be exploded much closer to the surface, which would reduce the affected area correspondingly. And if the city is defended, a substantial number of atom planes would have to be dispatched, with large escort forces, to fight their way through to the target.

At the risk of oversimplification, let me emphasize the significance of the target in choosing an appropriate agent of destruction.

Assume that the four square miles to be demolished consisted entirely of hay. A single match would then be as effective as one atom bomb. But if the four square miles consisted of concrete slabs, the atom bomb would be as futile as the match.

To annihilate the second kind of target, we need heavy, high-velocity, armor-piercing bombs. Eventually an atomic bomb may be developed encased in steel and detonated below the surface of the earth. Its explosion would create a minor local earthquake, possibly strong enough to topple over tall buildings in a modern city and destroy strong concrete underground installations. Even then, however, there is room for doubt whether the atomic weapon would be more efficient and more economical, in terms of national effort invested, than conventional explosives.

It has been stated that the Hiroshima bomb contained more power than twenty thousand tons of TNT. While this may be true as a fact in physics, it is misleading as military fact. The implication, for a layman, is that the bomb will be as *destructive* as a raid with twenty thousand tons of ordinary high-explosive bombs, which is patently false.

When an enormous amount of energy is released at *one* point, its efficiency, measured in results, is extremely poor in relation to the total

released. Only a fraction of the energy is effective, the rest being dissipated in space. The same aggregate of energy divided into small packages and distributed evenly over the same area would produce vastly more destruction.

To make a homely analogy: Suppose a farmer attempted to pile enough manure at the center of an acre of land to fertilize the entire area. If he piled enough of it, he *might* do the trick. Yet a very small fraction of the towering pile, if spread evenly over the entire acre, will give perfect results.

Similarly, in the application of destructive power, such "piling up" at one point is clearly uneconomical. An atom bomb concentrates terrific energy at the point of detonation, wholly out of proportion to the job to be done. It not merely wrecks but evaporates matter; it kills people not once but four times over—by blast, fire, flash heat, and radiation. If such squandered energy cost us nothing, it would not matter. But actually the process of compressing that immense energy into a single pill costs millions. Such promiscuous application of our national wealth may prove self-defeating.

That is why two hundred Superforts dropping only about two thousand tons of conventional explosive—not at one point but at hundreds of points—over four square miles of Hiroshima would have accomplished the same results as twenty thousand tons in a single atomic package, and at a far smaller cost per unit of destruction.

"But the atom-bombing involved only one airplane as against two hundred, a saving of a hundred and ninety-nine planes," the reader may protest. That, however, is true only if the attack is aimed at African savages who possess no air power, or at a defeated enemy who, like Japan in 1945, has been stripped of air power. When the target area is defended by aviation of adequate vitality, hundreds of supporting aircraft will have to be sent to guarantee the delivery of the atom bomb. So far as the aggregate air effort employed is concerned, there will be little if any advantage in favor of the atom bomb.

The idea that the original atom bombs were only "firecrackers" compared to those yet to be developed became a cliché of the more hysterical atom talk. The implication was that the military value of the bomb would be raised in proportion as its power was increased.



This is, of course, a fallacy. The problem, in making the use of atomic energy more efficient and more economical as a war weapon, is not to step up but to step *down* the amount of energy released by a single bomb. Even in its Hiroshima-Nagasaki-Bikini versions too large a part of the investment was militarily unproductive.

Another crucial consideration to be kept in mind is that ordinary explosives allow for better control of the character of the damage to be inflicted and the results to be attained. The attacker has a choice between destroying property and destroying human life; he can apply demolition bombs or incendiaries or a combination of the two in some planned ratio.

There is no such flexibility in the employment of atomic explosives. To us, as civilized people who value life and would not kill needlessly and recklessly, this is a most important feature. After all, our aim is to break the enemy's will to resist, and to do so with a minimum of destruction of both life and matter.

But to return to our discussion of targets: the greater their resistance to fire, blast, and radioactivity, the less the military effectiveness of the atomic weapon. Suppose the attack is directed not against a city but against an underground plant, or a modern concrete military objective such as a vital headquarters or a submarine pen or an atomic-energy plant shielded by massive concrete walls and roof. Then an atomic missile like the ones used on Japan could not duplicate the effects of an armor-piercing missile, rocket-driven to increase its terminal striking velocity.

The atom bomb, in short, is not an all-purpose weapon. There are, of course, tactical conditions and targets which justify its use. There are other targets and other conditions in which the conventional explosives will give better returns for the investment of wealth and labor and materials. The atom bomb is efficient primarily against the bigger cities. It can be used to paralyze the functioning of large administrative centers and the nerve-knots of industrial life of a nation. But against small targets requiring pinpoint and precision bombing, its use would be both inefficient and stupidly wasteful. And obviously we would not want to use the A-bomb against friendly areas under enemy occupation.

According to Dr. Kring, an individual plant spread over fifty acres

can be demolished with one hundred tons of conventional bombs properly placed. If the same industrial potential is concentrated on only three acres, ten tons of explosive will suffice.

One obvious reason for using an atomic bomb on such a plant is that it cannot possibly miss a three-acre target. But the same assurance of hitting the target can be guaranteed by using one hundred tons of ordinary explosive instead of the minimal ten tons. This tenfold investment of TNT and incendiaries will still be vastly cheaper than a single atom bomb.

This assumes an industrial plant of the ordinary construction of World War II vintage. But suppose that it is a new structure designed to resist or minimize atomic offensives, not necessarily buried under the surface but built to withstand the blast pressures of an atomic explosion. Toward the end of the last war the Germans were beginning to build shelters of that immense vitality. In that event only a direct atomic hit will be effective. But one hundred tons of ordinary bombs, covering an area ten times greater than the actual target, will come closer to guaranteeing a hit. Even if the whole hundred-ton pattern misses the target, our loss will be insignificant compared to a wasted atom missile.

Another fallacy remains to be dealt with. When scientists talk of an atom bomb one hundred times more powerful than the one released in Japan, the layman is likely to assume, mistakenly, a hundredfold increase in potential destruction. But the *effective* part of the increased power is only the part that makes contact with the target, the rest being dispersed in space. We must visualize the released energy as a gigantic sphere, only the lower segment of which is useful in the operation.

Let us put it this way: If an atom bomb can destroy a given building one mile from the center of the explosion, it must be enlarged a thousandfold to destroy the same building ten miles from the explosion. The bomb must be one thousand times more powerful in order that the radial striking distance affected by the released energy may be extended tenfold!

What is more, in a modern city of steel and stone and concrete, the explosion would necessarily have to take place close to the ground. The additional energy will be in large measure absorbed by inter-

vening structures, so that the radius of total destruction is likely to be far short even of the theoretical tenfold enlargement. The popular error is in confusing a three-dimensional expansion of power with the linear distance to which that power is applied. Theoretically, *radius of destruction is proportionate to the cube root of the energy released.*

This is relevant to the projected hydrogen bomb, which, some scientists guess, may release one thousand times more energy than the A-bomb and would therefore have a tenfold radius of destruction. It is difficult to appraise the tactical implications of the H-bomb until more data are available. At this writing it is still smothered in question marks. Some scientists, among them a top nuclear specialist like Dr. Millikan, are dubious whether it can be produced at all; Sumner T. Pike of the Atomic Energy Commission placed the chances somewhere between "probable" and "possible." Others estimate its strength from ten to one thousand times the A-bomb. Estimates of the costs of developing the first H-bomb range from two hundred millions to two billions, a disparity of one to ten. The time estimates range from two years to infinity.

Personally, I doubt whether the H-bomb can be produced and *stockpiled* soon enough to affect the present political emergency. Even if it is made available, I do not believe that it will be unleashed, since it would mean the certainty of instant retaliation in kind. Our ability to strike back will remain no matter how destructive an enemy's attack on our cities; after all, the American atom-bearing air force will not be deployed at Forty-second Street and Broadway. The same considerations which stopped the Nazis from using poison gas against enemy populations or slaughtering all prisoners of war are likely to be operative with respect to H-bombs. Moreover, as we have already seen, further release of energy at one point is not necessarily desirable or militarily efficient; a few A-bombs properly dispersed may be far more devastating, and at a critical saving in cost, than the theoretical H-bomb.

National conduct of war does not aim at killing for killing's sake. It does not seek to annihilate but to *disarm* the adversary. This sets limits on the military utility of A-bombs; and the larger the bomb, the narrower those limits. If and when a hydrogen bomb of the extreme dimensions under discussion is produced, its use may prove prohibitive,

both economically and in terms of the retaliation it must provoke. The science of war will not be abolished. Relative abilities to deliver destruction—which is to say air power—will still remain the decisive factor in the equation. Indeed, as the power of the atomic bomb is increased, the ability to carry retaliation in kind, regardless of enemy defenses, becomes paramount. As the threat of annihilation grows, the importance of *insurance of survival* grows with it, and that today means preponderant air power for offense and defense alike.

Of course, nuclear physics is in its infancy. The phenomena of fission have yet to be explored and applied. We have a right to speculate about bombs that will touch off endless chain reactions of destruction, capable of disintegrating a nation, a continent, a planet. Such speculations make exciting and nerve-tingling Sunday supplement articles. But there is no reason to allow them to distort strategic thinking and planning. We are still in the primitive stage of the development of atomic weapons. The next war, if there is one, will be fought within the confines of that stage.

Yet in the panic mood generated by the first exhibit of atomic destruction, mankind was stampeded into a species of hysteria. There was talk—since then muffled but by no means silenced—about the existing military forces having been canceled out, about military science having been obsoleted. Great masses of people, it would seem, have worked up an emotional stake in the bomb. In the anger with which they react to contentions that the atomic weapon is not apocalyptic, that the end of the world is not yet in sight, there is an undertone of disappointment. I must leave it to psychologists to explain this state of mind.

THE PREVAILING MOOD of hysteria was reflected in far-fetched theories of overwhelming one-blow attacks on the United States by atomic saboteurs in our midst. Bombs in suitcases would be planted at key spots in important American cities and exploded on signal from a foreign foe. Bombs conveyed in innocent-looking ships would be detonated in our great harbors, simultaneously, crippling coastal commerce and inundating the port cities with radioactive tidal waves.

The underlying notion—based on the dramatic Japanese surrender—seemed to be that a few bombs in the right places could force a country to quit. If two bombs sufficed for Japan, then half a dozen or a dozen could make Uncle Sam cry uncle!

The superstition that there are “easy” one-shot methods for knocking out a great nation may be good enough for the cartoon comics; it has no place in serious strategic thinking. If it causes the jitters and if it puts brakes on genuine preparedness for genuine military struggle, it can be positively harmful.

Sabotage has always been a hazard in time of war. But its value has been of the nuisance variety. It has never determined the outcome of a conflict. Conceivably a resourceful adversary might smuggle a few atom bombs into a country and explode them, doing great damage. But that this can possibly be carried out on a decisive scale is quite inconceivable.

We have need for keen intelligence work to intercept such dangers, but they can be discounted in basic war planning. Surprise blows on a sabotage basis may work out on paper. In practical warfare there is no substitute for sustained and organized combat.

When radio was first developed, there was a wave of apprehension in most military circles. Until then spies could transmit information only visually or orally, and therefore be easily detected. But radio was invisible and, at the point of origin, inaudible. Here, it was thought, was a means of safe espionage that left a country helplessly exposed. The spies could transmit all vital information without possibility of detection. But soon enough this threat was eliminated by the discovery of effective countermeasures. The direction finder was developed. Today no one can transmit radio signals without being swiftly located. I have no doubt that the atom-bomb saboteur will meet a similar fate. There are so many factors entering into the handling of the atomic weapon that methods for locating installations are inevitable.

The most widely feared of the sabotage theories is “suitcase warfare.” According to this fantasy, compact atom bombs will be brought into the country in packing cases, presumably by characters wearing false whiskers; they will be deployed at strategic points and exploded on signal from abroad.

The scheme does not survive calm examination. The bombs them-



selves and the paraphernalia for exploding them in a stationary position are too massive and bulky for easy secret handling. Contrary to the popular notion, the bombs cannot be kept in any old cellar or loft awaiting zero hour. There are technical problems of storing and maintenance—proper temperatures to prevent decay, for instance—which demand large premises, continuous servicing, and considerable personnel. A “suitcase offensive” on foreign soil would therefore be a major effort involving major dangers of accidents, denunciations, and discovery. And discovery of a single bomb would instantly alert us.

Even if successfully stored and detonated, the bombs would not cause enough havoc to be worth the risks. They would necessarily be exploded close to the ground, with destruction narrowly localized. Dr. Lapp reduces what he calls “a basement burst” to its proper proportions. Assuming the detonation of a secretly stored bomb in the basement of City Hall in lower Manhattan, an area of skyscrapers, he writes:

“Those who expect that the City Hall would be completely vaporized overestimate the power of the bomb. They should remember that at Alamogordo [New Mexico] the base of the hundred-foot iron tower still remained intact. *Even objects only one hundred feet from the center of the bomb explosion were not completely destroyed.* It is also pertinent to recall that the bomb crater at Alamogordo was only three hundred feet in diameter and quite shallow. This area, which is still *detectably* radioactive, is by no means *dangerous* today and was a hazard for only a short time.” \*

What would happen to the City Hall structure?

“Undoubtedly the building itself would collapse,” Dr. Lapp believes. “There would be a considerable earth shock in the vicinity but the actual displacement of earth to form a crater would not be enormous. A crater some five hundred feet in diameter might be expected. Major physical damage would be confined to an area not more than one thousand feet in radius, but the blast wave would undoubtedly cause superficial damage to buildings at a greater distance.” †

Obviously such descriptions are highly speculative. But I agree that the damage would be strictly local. It could not paralyze the life

\* *Must We Hide?*, by R. E. Lapp, page 81.

† *Ibid.*, page 80.

of a great city like New York or Pittsburgh or Chicago. Of course, if exploded at a vital point, such as a central powerhouse, it might temporarily dislocate a city's life. But that is true of any kind of sabotage, whether with conventional dynamite or the latest atomic explosives.

Another of the hysteria-born theories assumes the deployment of ships carrying atom bombs in our major harbors, ready to explode themselves and drench the port cities with atomically poisoned waters. The theory derives from one of the phenomena observed in the underwater burst at Bikini. I saw that phenomenon with my own eyes.

This is a convenient point for recalling the exaggerated expectations aroused by the advance announcements of Operation Crossroads. Earthquakes and tidal waves were forecast that would be felt thousands of miles from the scene. The temperatures unloosed, we were led to think, would melt the steel of ships; all fish and marine vegetation would be wiped out; mountain-high waves would wash away and great winds uproot every tree and man-made structure on Bikini Island. The whole ocean, it was feared, would be poisoned for a long time by radioactivity. Artists gave rein to their imaginations: I recall a drawing in which huge aircraft carriers were sliding down the steep walls of tidal waves to their nether doom.

Not one of these fevered prophecies came true. The extreme temperature at the center of the explosion lasted only for the twinkling of an eye. In the words of one observer, "its effect on ships is a flash 'sunburn'—surface paint blistered but undercoat unburned even within half a mile of the air burst." The wind velocities set up by the explosion fell away rapidly, so that not a leaf was wrenched from a Bikini tree. No ships were "melted" or "evaporated." Even light destroyers were floating upright when the waves subsided.

The towering water spout created at the point of detonation collapsed quickly. By the time its impact reached the island the waves were only about four feet high. They did not drench Bikini much beyond the high-tide water line. Yet this is the phenomenon on which the "harbor explosion" theory rests.

The "base surge" set moving by the underwater explosion was estimated to possess an initial velocity of about fifty miles an hour. But by the time it reached the Bikini shore its force was spent. It must be

remembered, in addition, that the Bikini lagoon is extremely deep in comparison with the shallow waters of a protected harbor like Boston or New York. A bomb exploded in a typical harbor could not possibly produce comparable water spouts and waves; there simply isn't enough water.

Besides, the Bikini surge was unimpeded, whereas in New York or Boston or Norfolk its force would be stemmed and broken by the large buildings. The zone drenched would hardly be more than a few hundred feet deep. Any poisoned spray, too, would be cut off by the city buildings and its possible danger thus narrowly restricted. At worst it would constitute a costly episode of sabotage, but of minor value in the overall struggle.

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IT SEEMS to me that the Atomic Energy Commission was born in the superheated atmosphere of atomic excitement. Its primary purpose was presumably to promote peacetime uses and commercial exploitation of the new source of energy. These are important objectives. No one "underrates" the ultimate civilian values.

Under the initial impact of the thrilling atomic story, uncritical and credulous Americans saw atom-driven ships, planes, and trains around the corner. The coal, oil, and electric power industries were led to worry about their tenure. But since then the optimism has abated; scientists themselves estimate the time factor for non-military uses at from ten to fifty years. Dr. J. Robert Oppenheimer, giving his views on commercial atom power to the United Nations Atomic Commission in August of 1947, said that no practical demonstration could be expected until 1952. But, he added, it will be somewhere between 1977 and 1997 "before atomic energy can in any substantial way supplement the general power resources of the world."

Dr. Lyle B. Borst, Major General L. R. Groves, and others have gone on record with cautious statements similar to that of the distinguished Italian scientist Dr. Enrico Fermi. Testifying before a Congressional committee on July 8, 1949, Dr. Fermi said that people had been "somewhat underestimating the difficulties," and concluded

that he does "not expect extremely startling industrial results for at least very, very many years to come." \* There is substantial agreement that atomic energy as a civilian power factor is in no sense immediate.

The only non-military feature of the atomic force actually developed is the radioactive isotope for radiological medicine. According to press dispatches in October, 1948, five pounds of that substance had been produced at that point, though many billions had been spent in the process. To package the five pounds for worldwide distribution required some 100,000,000 pounds of "wrapping."

Without belittling the value of isotopes or the eventual commercial-industrial potential of atomic energy, the fact remains that at this stage atomic energy is essentially and overwhelmingly a military potential. And it is sure to remain primarily military for the next ten years—a critical period in world affairs during which a life-and-death *military* decision may have to be made in our world.

Under these circumstances the creation of a civilian body in this area seems to me premature and unrealistic. To the extent that this may detract from the fullest military exploitation of the new factor it is also unhealthy. By the same logic we might as well set up an Interplanetary Commerce Commission since the progress of rockets leaves no doubt that interplanetary communication is only a matter of time.

Dr. Fermi testified that the obstacles to the commercial exploitation of atomic energy are not theoretical but "of a technical nature." The same thing is true of interplanetary rocketry. The problems of a man-carrying rocket to the moon have been theoretically solved, and the vehicle designed, for a long time. What holds us back is likewise minor problems "of a technical nature." On the whole, therefore, an Interplanetary Commerce Commission has almost as much justification at this time as a civil Atomic Energy Commission.

In the dawn of the aviation epoch, the initial large-scale utilization of aircraft was entrusted to military direction. Research and development by our government was conducted in terms of national defense. The creation of the National Advisory Committee for Aeronautics before the First World War was promoted by military considerations.

\* Investigation into the U.S. Atomic Energy Project, Part II, pages 866-7.

Only after the commercial use of aircraft expanded to an appreciable degree did we establish a Civil Aeronautics Authority in the Commerce Department.

No one can guess what would have happened if immediately after the Wright Brothers' flight our government had set up a civilian Aviation Commission with exclusive power of research, control, and regulation, military and non-military alike. This, by analogy, is precisely what we have done in the atomic domain—and at a time, moreover, when the military importance of atomic energy is an urgent fact, involving the very survival of our country and our civilization!

Only time will tell whether this is a mistake: whether we have been wise in putting the accent on commerce at a time when the new force is almost exclusively military. My own belief is that until the balance swings toward civilian uses, our approach to atomic energy ought to be frankly, intensively, unimpededly military, whether this energy is explosive, propulsive, or any other type.

When atomic energy is ripe for use in transportation, the principal beneficiary, we may be sure, will be aircraft. Every scientific advance in propulsion hereafter will pay greatest dividends in the air.

Atomic propulsion may bring great economies in surface transport, but it can have no revolutionary effects. Railroad engines, for instance, can already be built with power beyond what a train can absorb, so that a further increase in energy will change nothing. The speed will be limited by tracks, and carrying capacity by practical restrictions on size of cars and length of trains. Nor will atomic power basically alter the automotive picture. The limiting factors here are not in the engine, but in practical ceilings on speed, weight, size, head clearance—none of which will be materially affected by the availability of tremendous power.

Sea transportation will also draw comparatively small benefits. The laws of physics set bounds on speeds on or under water. Tonnage limits will be fixed by structural considerations—after all, it would make no sense to build a liner a hundred times as large as the *Queen Mary*.

In the air, on the contrary, the effects of atomic propulsion will be revolutionary to a degree that staggers the imagination, particularly if the energy is available at virtually no weight. Interplanetary com-



munication will become practical. Aircraft will be able to transport tonnage restricted only by the dimensions of the plane, just as in an ocean liner today. With such power at their disposal, planes will be able to rise vertically; to hover; to fly with unlimited speeds for unlimited distances. Indeed, with the advent of atomic propulsion, the surface of the earth may well be largely abandoned as a roadbed for transportation. Everything will move in the air, including even individuals, in personal carriers no larger or more complex than a motorcycle.

The future, in short, promises ever greater and ultimately absolute dominance of air over all surface forms existing or yet to be devised. And the predominant form of transportation, as we have seen, always defines the predominant military strategy of its era.

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ESTIMATES of the number of atomic bombs required to destroy a great nation range from 40, the figure used by journalist William L. Laurence,\* to 6,500, that used by Dr. Stefan T. Possony, "*provided* no bomb carriers are intercepted and no defensive measures against atomic bombs are taken." †

To get a clearer picture of this issue, let us attempt to translate the actual aggregate World War II Anglo-American aerial attacks on Europe into atomic equivalents. Naturally, the calculations can be no more than very rough approximations. There are too many imponderables for hard and fast ratios. The size and destructiveness of the bomb are variables, as are the effects, depending, as we have seen, on the character of the targets, the altitude of detonation, and other factors. But there is fairly general agreement on some basic figures.

The Hiroshima bomb annihilated 4 square miles, a total destruction which could have been duplicated by 2,000 tons of ordinary bombs. The equivalent for one atom bomb here is therefore 2,000 tons, but the ratio is reduced as we consider more resistant targets.

Take Hamburg, for instance, both the modern center and the flim-

\* Town Meeting of the Air, October 25, 1949, page 9 of published text.

† *Strategic Air Power*, by Stefan T. Possony, Infantry Journal Press, 1949, page 61.

sier outskirts. The British dropped 7,196 tons on this objective and the Americans 800 more, a total of about 8,000 tons. With this they destroyed 10 square miles—800 tons per square mile. The consensus is that the Hiroshima bomb applied to a city like Hamburg would have razed  $1\frac{1}{2}$  square miles, making the equivalent for that target 1,200 tons of conventional explosives to one atom bomb.

To destroy one square mile of the heart of an average modern American or German city, about 1,300 tons of TNT would be needed. An atomic bomb exploded low enough to deal with such a target would destroy about  $\frac{2}{3}$  of a square mile, making an equivalent of about 900 tons to one atom bomb.

Finally we come to the sturdiest and most resistant urban target, the steel and concrete centers of modern cities like New York and Chicago. I subscribe to the estimates made by Dr. Lapp, Dr. Kring, and others, to the general effect that the Hiroshima bomb, exploded low enough to achieve severe concentrated destruction, would wipe out about  $\frac{1}{4}$  square mile. With conventional explosives a square mile of such a target requires perhaps 2,000 tons, making the equivalent per atom bomb 500 tons.

Thus we have ratios ranging from 2,000 tons, when a highly fragile and inflammable target is involved, to 500, when blast- and fire-resisting objectives are involved, pointing up the fact that *the more resistant the target, the less efficient the atom bomb becomes as compared with ordinary bombing.*

The reasons for this rapid drop in atomic efficiency have been sufficiently explained in the foregoing pages. To put the idea in the most elementary form: An atomic bomb equal to 20,000 tons of TNT (40,000,000 pounds) can destroy a brick house 2 miles away; but that same house can be destroyed with only 500 pounds of explosive deposited on it directly.

According to official American computations, the Allies dropped a total of 2,638,000 tons of bombs on Germany and German-held Europe. This tonnage is broken down according to types of target, as follows:

1. Land Transportation ..... 800,000
2. Industrial Areas ..... 640,000
3. Military ..... 300,000

4. Oil and Chemicals .....	250,000
5. Airfields .....	190,000
6. Aircraft Factories .....	48,000
7. Others .....	410,000
<b>TOTAL .....</b>	<b>2,638,000</b>

In order to transpose this aggregate tonnage into atomic terms, we must divide the targets into two categories: those that are inflammable and blast-susceptible, and the balance, more fire- and blast-resistant.

The whole of the tonnage applied to Industrial Areas and Oil-Chemicals, as well as about one-half of the explosives absorbed in the Military and miscellaneous (Others) groups, fall into the first category. We are safe in taking the Hamburg 1,200-to-1 ratio for these targets. The total being 1,250,000 tons, it would require about 1,000 atom bombs to attain the same amount of destruction.

For the balance, 1,388,000 tons, we must use the smaller 500-to-1 ratio, giving us 2,800 atom bombs. In other words, a total of 3,800 A-bombs is the equivalent of the 2,638,000 tons of non-atomic explosives unloaded on Europe.

But a far-reaching corrective is inescapable at this point. There were innumerable bombing objectives which would have been utterly unprofitable for atomic attack. Submarine pens, bridges, railroad depots, dozens of other targets calling for pinpoint demolition would have absorbed one atom bomb each, had we insisted on using no other types. Important but relatively small and isolated factories likewise would have required one atom bomb apiece. The estimate of 3,800 must therefore be stepped up to allow for such targets, raising the figure, conservatively, to 5,000 atom bombs.

*Theoretically*—assuming that atomic explosives only were used—5,000 is a fair and even modest atomic equivalent for the non-atomic destruction imposed on Germany and its associated or conquered territories.

This obviously is a long way removed from the vague talk about forcing a nation to surrender with “a few” or “a handful” of atomic missiles. A stockpile of 5,000 is many times larger than the whole world possesses or is likely to manufacture in a few years. Their cost,

not in monetary terms only but in labor and materials, would be enormously in excess of the cost of the 2,638,000 tons of old-style demolition and explosive bombs actually used. We need only think of the annual appropriations for atomic purposes and relate those to the likely size of our stockpile (still a secret but known in a general way) to realize that the enterprise begins to look economically preposterous.

Besides—and here we are at the crux of the matter—while the atom bomb would be an efficient substitute against some of the targets, it would be entirely unsuited for others. We must analyze the total destruction to determine against which of the targets atom bombs could be reasonably applied.

Our problem is to estimate what proportion of the tonnage, dropped on each of the target groups, might be *efficiently* replaced by atomic explosives and then to apply the TNT-atomic ratio appropriate for each group. Taking them in the order as listed by the Survey:

1. *Transportation*: This is clearly an unprofitable atomic target. Trolley tracks and overhead trolley cables in Hiroshima were back in use within two days after the atomic attack. Marshaling yards and even some depots could withstand atomic blows. Pinpoint bombing with appropriate non-atomic explosives is called for. Thus in attempting to transpose the destruction into atomic terms, at least 600,000 of the 800,000 tons must be reassigned to “old-fashioned” weapons, 200,000 being reserved for atomic doom. Since transportation objectives are virtually all exceedingly resistant, the 500-to-1 ratio is in place—indicating a need for 400 A-bombs.

2. *Industrial Areas*: Some of these were concentrated in large centers and would have justified the use of atom bombs. Others were isolated plants, or types of structures requiring precision demolition, and therefore to be dealt with more effectively and economically by non-atomic bombs. To use the A-bomb against these small individual targets would be like shooting squirrels with 75 mm. shells. We are safe in assigning about  $\frac{1}{2}$  of the total, or 480,000 tons, to the atomic column. Here the Hamburg or 1,200-to-1 standard is applicable, giving us again 400 A-bombs.

3. *Military*: Not more than one-half of these, or some 150,000 tons, can be earmarked for atomic demolition. Lying somewhere between

the extreme ratios, 750 tons per atom bomb is reasonable, with 200 A-bombs indicated.

4. *Oil and Chemicals*: These might be dealt with largely atomically, let us say to the extent of displacing 200,000 tons. Being considerably more resistant than average area targets, let us assign a 1,000-to-1 ratio, with 100 A-bombs again indicated.

5. *Airfields*: The employment of the atomic weapon against these would be sheer waste, and inefficient as well. Nevertheless, let us suppose that 50,000 tons might in exceptional cases be substituted for by atom bombs. Being isolated and highly resistant targets, the 500-to-1 ratio applies, giving us 100 more A-bombs.

In the last two categories—*Aircraft Factories* and *Others*—we can safely divide the job on a fifty-fifty basis, putting an aggregate of some 225,000 tons into the atomic column. Using the Hamburg ratio, this would add 200 A-bombs to the total.

When we add up these estimated replacements as translated into atomic equivalents, we get a total of 1,400 atomic bombs, with the difference—1,329,000 tons—remaining for destruction by the conventional types of bombs.

The explosives rained on Germany were carried by B-17 Flying Fortresses and Liberators with an average of 3 tons in useful striking power. It therefore required nearly 1,000,000 sorties—that is, flights by individual bombers. Had we employed B-29's with a 10-ton capacity, the sorties would have been cut to 270,000. With atom bombs taking the place of nearly half the tonnage, the sorties are reduced to about 135,000, of which 1,400 would be flights by aircraft conveying atom bombs.

This seems a substantial reduction of effort. But the picture is a lot less optimistic when we consider *attacks* instead of sorties. The attack, by a formation of bombers with their complement of escorting combat force, aims at the annihilation or neutralization of a given target. The number of attacks is not determined by the character of the explosives but by the number of targets and their distribution in the enemy territory. Generally speaking, it is not variable; the number of attacks required would not have been too much affected by the substitution of the atomic for the pre-atomic missiles wherever possible.



In delivering an atom bomb, the attacking force will have to be formidable. When one hundred or more old-style bombs are to be dropped, some planes will reach their mark and others will be shot down. But when the entire bombload in a given attack is in a single package, in one bomb carried by one plane, the margins for failure must be reduced as near to nil as possible. Should the one bomber be intercepted, the whole attack would fail. Vastly more elaborate escort force must therefore be set up, requiring more planes and therefore offsetting the saving in sorties.

In addition, future defenses will assuredly be more effective. The strategic surprise element will be drastically reduced. That in turn will demand still more technical and expensive protective forces. The overall complex of aviation per attack will consequently not be substantially smaller—certainly no smaller when reckoned in economic terms—than in the past.

Thus, while the number of sorties could be reduced by nearly half, the number of attacks would remain about the same. And the overall air effort as measured in tonnage of aircraft employed to make delivery possible, as well as the aggregate crews, would probably be no smaller than in the actual World War II effort.

These estimates are of necessity rough. But they do sketch the basic picture. Discounting mistakes in both directions, they should suffice to end the notion that the advent of the new explosive has miraculously "simplified" the task of defeating a great nation; that the next war will be decided in a few days or a few weeks. To destroy the war-making vitals of a well-prepared and mighty belligerent will take not a few but thousands of atom missiles, along with millions of the non-atomic varieties.

As one who has fought against inertia and apathy in relation to air power, I am gratified that the emergence of atomic energy has found an alert public. But I see no excuse for a frenzy that hampers understanding and sensible planning. Our only safety is in a calm contemplation of the truth, so that we may place the atom bomb in a reasonable relation to existing forces.

After my return from Hiroshima and Nagasaki I urged a cooling-off period on atomic speculation. I still feel that we need time and

strong nerves to digest the new facts. There will be no common-sense ceiling on fantasy unless the American people have those facts.

Excessive secrecy and mystery—on matters which are neither secret nor mysterious to nuclear scientists and engineers in other countries—is a product of the hysterical temper and also fortifies that temper. The American people should know where they stand in the dawning atomic era. Only then can they avoid fatalistic apathy at one extreme and overconfidence at the other. “Atomic energy injects a vital and perhaps revolutionary new factor into military science and world relations. But I do not believe that the revolution has already taken place and that we should surrender our normal faculties to a kind of atomic frenzy.” \*

A future war will not necessarily be decided in one wild atomic flash. The twenty-four-hour or twenty-four-day victory is a tempting vision—at least when it presupposes *our* victory—but hardly a sound basis for planning national security. A new world struggle may last years, with triumph for the side that can mount and sustain an offensive involving huge attrition.

Neither the scaring nor the slaughter of the population in an enemy country will end a war. Only the actual physical elimination of the foe's means to wage war, the realization of the hopelessness of continued resistance, will bring surrender. The kind of explosives used to bring about this elimination will not alter this military truth.

At this point I must again underline that I am not “belittling” the atom bomb or its horizons of future improvement. My purpose is only to put some common-sense brakes on runaway fantasy; to help undo the mental mischief wrought by the heralds of apocryphal, cataclysmic, absolute, and all-purpose weapons.

The destruction of the industrial potential of a major country, to the point where its capacity to resist is canceled out, will call for gigantic effort, the application of the science of war, and extensive advance planning—precisely as in the pre-atomic era. The hit-and-run fallacies, the neglect of the combat factors, and the rest of the wishful thinking in the wake of the atom bomb must be forsworn in any serious preparations for warfare and victory.

\* “Atomic Bomb Hysteria,” by the author; *Reader's Digest*, February, 1946.

The atom bomb alone cannot win a war, because other brands of explosive have not lost their role. The notion that the new bomb enables us to carry war to an enemy easily and with relative impunity must be counted out.

Stripped of its doomsday aura, set in its proper place as a more potent but still finite explosive in the military arsenal, even the political implications of the bomb are more easily comprehended. To single out one explosive for special international treatment becomes rather far-fetched.

To outlaw the use of atomic missiles would be as illogical as outlawing planes or blockbusters, tanks or bazookas, and legalizing war only if it is fought with bayonets. In effect it would put a premium on technological backwardness. As long as resort to force remains to plague us, the American people should have no scruples in preparing to exploit their technological advantages to the limit, to guarantee victory. In both military and moral terms, President Truman is fully justified, it seems to me, in warning that the A-bomb would be used, "if the welfare of the United States and the democracies of the world are at stake." \*

Once we are at war, whether or not this weapon is employed should be governed by purely military considerations. Naturally, wise and civilized strategists will apply the most humane methods of conducting a conflict and assuring victory; but the most devastating explosive if applied skillfully and on time may prove the most humane in the end.

It is not the atomic weapon, but *war itself*, that should be outlawed.

\* In an address to new members of Congress on April 6, 1949.

## DEFENSE IN THE ATOMIC AGE

## 1

WE HAVE DISCUSSED the atomic weapon from the angle of the offensive. Turning to defensive considerations does not require an abrupt switch of perspective. That the best defense is a vigorous offense is an old rule, but never before has its truth been more to the point.

If the contention is valid that superior means of delivery are more important than larger atomic stockpiles, then the heart of the defensive problem is in air power. When we reduce the enemy's aerial might, we reduce his ability to deliver destruction, the atomic kind included. Should we succeed in keeping him out of our skies altogether, we will for all practical purposes have eliminated the atomic threat.

True, the enemy will probably crash through to drop bombs—many or few—despite everything. But he will know that these cannot score a decision. He will be acutely aware that his own skies are wide open to our aircraft for overwhelming punishment. Under those conditions he is not likely to indulge himself in futile and provocative actions.

Since August 6, 1945, we have heard choral warnings that there is no defense against the atom bomb. They are curiously illogical, suggesting as they do that there *are* defenses against other varieties of bombs. But what defense did the inhabitants of Hamburg, Cologne, or Tokyo have against the saturation bombings with pre-atomic explosives that brought wreckage and wholesale death much greater than at Hiroshima? What defense was there on the high seas in pre-aviation eras against hostile naval force, except its elimination by superior naval force?

It is often assumed that for every weapon there is, or should be, a counterweapon. But there is still no "defense" against bullets and

bayonets, short of disarming or destroying the opposing soldier before he can use them. Human life is so fragile that, as between ordinary bombs and an atomic burst, there is little to choose. The candle flame is no less doomed in a mild draft than in a hurricane.

The appearance of every new instrument of war, from gunpowder to poison gas, from cannon balls to atomic bombs, has alarmed mankind to the panic point. We still remember the chill down our spines when buzz bombs began to fall on London. Momentarily the wielder of a new weapon has the physical and psychological advantage of surprise. But in time the balance is restored on the new level of destructiveness.

A direct hit will kill, whether it is a bullet, a half-ton demolition bomb, an eleven-ton grand slam, or an atom bomb. In every instance protection is provided by distance and by physical mass. The energy released by the atomic explosive being vastly greater, the shields of distance and mass must be correspondingly greater. But when we think of the atom bomb as the equivalent of a mass assault with two thousand tons of high-explosive and incendiary bombs—a familiar enough occurrence in the last war—the atomic attack loses some of its aura of *unique* and special hopelessness.

Huge casualties are in the nature of modern technological warfare. Advance planning, however, can minimize the toll of death and mitigate the sufferings of the wounded. As pointed out in Chapter IX, the staggering loss of life in Hiroshima and Nagasaki was in large measure due to the factor of absolute surprise, made worse by the utter bewilderment and panic induced by the novelty of the weapon. On this point, at least, there is general agreement.

True defense lies in the capacity of a nation to intercept and destroy the attacking force. This is "active defense." Beyond that there is only "passive defense"—the planned readiness to reduce the effects and to deal with them efficiently where they cannot be evaded. As in any other type of bombing, the final outcome will be decided by the relative ability of belligerents to absorb punishment while carrying more of it to the enemy.

This vigor under attack is the essence of passive defense. The first imperative, of course, is the fortification of the physical plant, of the country's productive potential. Obviously the entire surface cannot



be made impregnable. The job comes down to shielding the most vital organs of national life. In protecting warships, tanks, or aircraft, we do not encase them totally in armor; we only shield the portions most important for combat vitality and survival. The same reasoning applies to a country as a whole. Areas and structures germane to the successful prosecution of the war will logically be the enemy's priority targets and should, by the identical logic, be accorded priority in "armoring."

The second imperative is the fortification of the morale of the population. We need the robust popular morale that derives from confidence. Our people must realize that there *are* defense measures, properly and efficiently organized in good time. Large-scale evacuation of children and non-essential adults from vulnerable districts will be of the utmost importance in holding down casualties. Detailed mobilization, transport and resettlement plans, and the stockpiling of critical food and medical supplies in well-protected spots should be worked out far in advance of any war danger.

The morale of a nation determined to defend itself cannot easily be broken. Ideologically inspired people can withstand great amounts of punishment. It is never fear, horror, or misery which makes a people at war collapse but the actual elimination of the physical industrial means to make war.

Life is scarcely worth living at the price of permanent prostration before the specter of death. We do not fall into defeatism because earthquakes, cyclones, floods, epidemics, and, for that matter, highway traffic threaten us continually with sudden extinction. The perils of aerial bombing must be faced in the same common-sense spirit of calm courage.

Having taken every reasonable precaution, having provided adequate military force of the right kind to meet any challenge, having organized medical and other civil forces to deal with the various problems, a nation must go about its business of living without atomic jitters. Any other attitude merely gives the right of way to aggression and international extortion.

The "one world or none" approach being preached by some Americans seems to me at this stage militarily unsound and morally defeatist.

Most of the men and women in the atomized Japanese cities who survived at points almost directly under the explosions had been shielded only by the masonry of a modern building. Others had happened, by sheer chance, to be in natural earthen shelters.

"The most instructive fact at Nagasaki," the U.S. Bombing Survey declared, "was the survival, even when near ground zero, of the few hundred people who were placed in tunnel shelters. Carefully built shelters, though unoccupied, stood up well in both cities. Without question, shelters can protect those who get to them against anything but a direct hit. Adequate warning will assure that a maximum will get to shelters. . . .

"Analysis of the protection of survivors within a few hundred feet of ground zero shows that shielding is possible even against gamma rays. Adequate shelters can be built which will reduce substantially the casualties from radiation. . . .

"It appears that a few feet of concrete, or a somewhat greater thickness of earth, furnished sufficient protection to humans, even those close to ground zero, to prevent serious aftereffects from radiation. . . ."

It should be kept in mind that the chief killers in an atomic burst are blast and fire—exactly as in TNT and incendiary attacks. The defensive techniques are therefore of the same general order. Congested areas are the most vulnerable; they also offer the most inviting and profitable targets for atomic attack. The obvious theoretical answer is proper dispersal.

A modern industrial plant consisting of a dozen buildings in a tight cluster that can be damaged with a single A-bomb represents a profitable target. The same plant, if its buildings are separated from one another by, say, a mile, would require twelve bombs, which might mean more of an investment in national effort than the plant is worth. The use of ordinary bombs would be more sensible.

As a practical matter, however, dispersal is hardly a consoling answer. Ours is an urban civilization. Decentralization of life on a scale sufficient to evade bombing risks would be an undertaking of such stupendous size that it would soak up all our energies and pauperize

us in the process. Even if we were compelled to start so drastic a recasting of our physical pattern of existence, it would take many decades to finish. The emergency with which we are concerned is too immediate for that.

Within reasonable limits, of course, much can be done to obtain not total but *more* and *correct* dispersal. After all, the abolition of slums, the spread of population to spacious suburban developments, are desirable ends in themselves. The fact that they also cut down bomb hazards should stimulate these healthy trends. Greater safety in the air age should become a conscious element in planning, rather than an accidental by-product.

With respect to industry, too, it is self-evident that concentration raises the wartime risks. As far as it can be done without destroying efficiency, our production facilities should therefore be distributed over larger areas. In projecting new factories, certainly, the safety factor with reference to bombing must hereafter be taken seriously into consideration.

Industries vital for war-making, and particularly for air power, ought not to remain close-packed at a few points. That amounts to putting all our eggs in one basket. In the next war many of the most decisive products will be of recent or entirely novel development: the atom bomb, radar, jet and rocket engines, electronic devices, guided missiles, etc. Of necessity their output will be expanded in the years ahead, necessitating new industrial construction. It would be unpardonable if we did not exploit the opportunity to disperse the new facilities and to make them bomb-proof from the outset.

I am not suggesting that industry arbitrarily be spread thin over the entire country. The danger of such extreme dispersal, as German experience showed, is that it makes industry too dependent on transportation. Enemy bombers are thereby provided with another and sometimes easier method for stalling production—by wrecking transport facilities.

It should be noted that American transport enjoys certain advantages compared with that of Soviet Russia. Besides railroads, we have unequaled systems of motorized and air communications. The cutting of rail lines would simply throw more traffic into motor vehicles and airlift. The crippling of motor highways would be answered with

more caterpillar trucks. An enemy who plans to paralyze our life by wrecking transportation will be faced with a formidable task.

I do suggest that component structures of a given industrial unit be so deployed as to require a maximum number of individual bombing sorties. This would make the use of atomic missiles prohibitive, and the application of any explosives more difficult. Defensive dispersal, in other words, does not necessarily mean moving a Connecticut plant to Kansas.

To an attacker across the North Pole, it would mean only a change of a few degrees on his compass course to bomb Kansas instead of Connecticut. What is important at either place is putting a few miles of distance between the various structures of the plant, so that their elimination in one blow becomes impossible.

The dangers of industrial concentration, in any event, are not products of the atomic age. The atom bomb has merely intensified a condition that has long been apparent. In 1942 I wrote:

The hazards of the present excessively centralized industrial and power resources are obvious. Consider such extreme cases as those provided by the American manufacture of bombsights and other precision instruments for aviation, or of airplane engine production, at the outbreak of the war.

A few tons of explosive well placed on a relatively few plants might have paralyzed all our airplane output! Despite the sacrifice in economy, decentralization of American industry in general, and war industries in particular, cannot be avoided. The value of dispersion and of both natural and artificial camouflage must hereafter be considered in planning factory construction. Certainly military defense enterprises must . . . be broken down into relatively small units scattered through the nation, each absolutely self-contained, fed by its own power-plant constructed far underground, beyond the reach of enemy bombs.\*

From this point of view, great power aggregates like TVA, Grand Coulee, and Boulder Dam are weak points, running contrary to sound military defense principles, however desirable they may be in a purely peaceful context. Obviously they offer highly profitable

\* *Victory Through Air Power*, page 327.



### THE MEANING OF INDUSTRIAL DISPERSAL

For an airplane taking off from Russia, the distance to New York or Kansas City or San Francisco is about the same. Kansas City is therefore as accessible as a coastal city, requiring simply a 15-degree shift in compass course. Transfer of a plant from Connecticut or California to the Midwest does not make the attacker's task any more difficult. The essence of defensive dispersal is not in geographical location but in the local deployment of component units. A dozen buildings in a tight cluster (A) offer a profitable target, subject to destruction with a single atomic missile. The same buildings properly dispersed (B) would require 12 bombs and might make the attack unprofitable.



targets, since their destruction would cripple a large industrial area, and consequently would require substantial air defense.

The scope of camouflage has been greatly extended since World War II. In addition to visual camouflage, and deception by duplicating the structural contours of some valuable target, electronic deception will be possible. Distorted and misleading patterns can be produced on the enemy's screen; he will see and identify the electronic image of some city far from its true location.

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IN THEORY, the bombing threat, atomic and non-atomic, could be largely met by sinking our society deep underground, beyond the reach of blast, flash heat, and radiation. But in practice, again, this answer is scarcely satisfactory. The cure—reducing us to a race of molelike creatures—is not much better than the disease. There is little point in discussing any such far-fetched undertaking. Besides, an enemy need only plug the holes by pinpoint bombing to make the burial complete and permanent.

Yet the immunity offered by below-surface locations must be kept in view in projecting new factories, especially in the key war industries, and even in planning mass dwellings and office structures. Underground shelters like subways and deep cellars offer nearly complete protection against all the effects of an atomic burst, except in a direct hit.

In our largest cities a considerable part of the life of inhabitants is already below the surface. Anyone who has wandered in the maze of interlaced subways in Manhattan, or on the under-surface level of Radio City where the various buildings are linked through underground passages, is aware of this. It can be taken for granted that more and more essential functions will be carried on in those safer depths as a precaution against bomb dangers.

Civilian architecture will inevitably be affected by the air age. Materials will be increasingly selected for their resistance against bombs. Gathering places which do not require daylight—such as motion picture theaters, ballrooms, and banquet halls—may well be built underground as natural air-raid retreats. Advances in air conditioning and

artificial lighting may combine with this tendency to invert our architecture; skyscrapers may be built downward as well as upward.

In the initial stage of a war the offensive and defensive equipment *already in existence* must be given number one priority in the matter of underground protection (as well as dispersal, bomb-proof construction, and so on). The aircraft industry, repair and maintenance depots, stockpiles of explosives, radar detection facilities, fuel storage, centers of military administration—in short, the aeronautical potential in the widest meaning of the phrase—must be made as nearly immune to overhead assault as is humanly possible.

Why this element has been largely neglected in new industrial construction during and since the war is a mystery to me. We did move some of the enlarged aviation industry facilities to Texas, Oklahoma, and other interior sites. For better concealment and partial protection, these new plants were built without windows, being artificially lighted and ventilated. Such steps in the right direction, taken when the bombing threat was still very remote, make it all the more remarkable that subsequently, when the danger became more and more real, billion-dollar industries, representing sizable chunks of our national wealth, should have been grouped in a few aggregates above ground where they provide perfect targets for ordinary lightweight bombs.

According to Dr. Charles Kring, immense amounts of information were netted by our intensive studies of the behavior of structures under bombardment in World War II. Intelligent application of available data could make buildings two or three times more resistant to blast, at only a fractional increase in costs. But we need not delude ourselves that a plant below surface or built into a hillside is automatically made impervious to bombing. Much depends on where it is built, how it is designed, its power and communications facilities, a lot of other factors. Of what avail will a structurally bomb-proof factory be if it can be neutralized through destruction of its communications, so that neither raw materials can arrive nor finished products leave?

The Messerschmitt plant in Kahla, in the foothills of the Harz Mountains near Jena, home of the Zeiss works, is frequently cited as the great German achievement in underground construction. I spent an entire day wandering through the nether labyrinth, studying the

installations, entrances, and exits. In addition I flew over the area to appraise its vulnerability from the air. And I reached the conclusion that far from being the masterpiece of ingenuity so widely heralded, the Kahla project was a monstrosity from the viewpoint of efficiency. The subject is so pertinent to American aircraft manufacturers, industrial designers, and architects that it merits some attention.

The plant, built inside a hill, consisted of a maze of long corridors or tunnels, broadened at intervals into a series of assembly shops. The peak of the hill was leveled off into a sort of flattop or air-drome from which the finished planes—ME-262 jets—could take off. Access to all the entrances and exits was along a high, narrow concrete road winding on the side of the hill. Part of that road was of cantilever construction, supported by beams anchored in the hillside. Planes were conveyed to the flattop by a completely exposed escalator. Incredibly, all the engineering and administrative offices, instead of being buried like the rest of the plant, were in a structure projecting from the side of the hill like a great concrete wart. Though designed to withstand a direct hit by fairly large bombs, it could have been neutralized by an avalanche of earth loosened by small bombs striking above the structure.

As for the precarious road to the plant, and the escalator as well, a salvo of lightweight bombs would have sufficed to “shave” it off, making the whole enterprise useless. The airfield, too, was wide open to bombing. To bring materials, machinery, and labor to the top for repairs—along a road so easily blasted and blocked—would have been a superhuman job. Despite concealment within a hill, the plant was therefore extremely vulnerable.

To make matters worse, only the sheet-metal work, the facilities for air-frame manufacture, and aircraft assembly were centered at the Kahla hideout. All the engines, instruments, accessories, and other parts were brought from the outside, again by way of the exposed winding road. The successful bombing of any of the plants feeding parts to this factory would therefore have sufficed to make the entire effort worthless. Indeed, the more I looked the more I wondered whether some anti-Nazi saboteur had thought up the grotesque plan.

This is not the place for a full analysis of correct underground construction. Yet a few principles, based on my inspection of a great

many sub-surface installations both in Germany and Japan, deserve to be touched upon. Such plants must be made as nearly self-contained as is physically possible. Under ideal conditions, raw materials should roll in at one end and finished goods roll out at the other end. In any event, dependence on other plants for vital parts must be reduced to an absolute minimum. If it is an aircraft factory, the planes should take off from concealed runways, like bees leaving a beehive. It would be advantageous, of course, if the main approaches were through tunnels beginning miles from the main underground aggregate. If not, the approaches should be, as far as possible, on level ground, so that their repair after bombing raids will not be a major engineering problem. In supplying raw materials and other necessities, motor transport is preferable—highways being less vulnerable to bombardment than railways.

Underground protection, it thus appears, is not as elementary as it sounds. Invulnerability to direct attack is the beginning, not the end, of the problem. Numerous elements, such as accessibility, communications, power, raw materials, self-sufficiency, etc., enter into the design formula.

IN ADDITION to blast and incendiary effects, the atom bomb deals out death by flash-heat and by radiation. These are the unique atomic phenomena, especially frightening because of their novelty. Widespread education on these dangers will reduce the psychological factor, the element of paralyzing fear. A "mysterious" peril is infinitely more dangerous than one that is clearly foreseen and comprehended.

Our people must learn how flash-heat and radioactivity affect the human organism, and how to protect themselves against them. They must grasp the fact that effective shielding is possible and feasible. The proof is in the circumstance that hundreds of people in the atom-bombed Japanese cities within the immediate radius of explosion remained alive and unscathed.

Even the flimsiest wooden wall is enough to shield life against the moment of intense flash. Protection against gamma rays requires much greater mass. But the aggregate thickness of many intervening walls did the trick in Japan. The lethal effects of radiation depend, of

course, on distance as well as intervening mass. About a mile from the explosion, a foot of concrete will suffice to protect the human body; at ground zero three feet are needed. An inside room or corridor, placing several walls between you and the radiations, will spell safety. Much still remains to be learned about the effects and safeguards against radiation.

Burns of moderate intensity can be healed; they are no different in kind from the familiar effects of extreme sunburn. Under the urgency of the atomic threat, physicians are also learning rapidly how to treat radiation effects which, untreated, killed their victims in Japan.

According to the Associated Press, "a commercial dye, toluidine blue, has been found to be a potent antidote to one of the most deadly effects of the atom bomb." It stops hemorrhages caused by exposure to atomic rays, after which blood plasma is administered to the victim. At the Scripps Memorial Hospital in Lajolla, California, promising results in overcoming blood damage through radiation have been attained with a chemical from lemon peel.

Studies on animals at the University of Oregon Medical School have indicated the possibility of raising or lowering sensitivity to radiation. In October, 1949, five scientists reported encouraging experimental results in the treatment of atomic-radiation sickness with aureomycin. It is within the range of the possible that at the sound of the air-raid siren people will fortify themselves against radioactivity by taking prescribed tablets.

Whatever the ultimate value of any of these discoveries, the heartening fact is that medical researchers are at work on the challenge, and not without success.

Although the flash-heat in an atomic explosion lasts only for a fraction of a second, this is enough to scorch to death those directly exposed to it, and to inflict third-degree burns even at distances of over a mile. Ultraviolet rays—plain sunburn in extreme doses—caused more deaths than flash-burns in Japan.

On the other hand, a thin layer of masonry (wall or ceiling) can give full immunity. In the Japanese cities it was found that even clothing offered some protection. Garments of light colors deflected the flash better than dark shades. A white bedsheet over the entire head and body will ward off the momentary heat menace. The preva-



lent color in the next war is likely to be not khaki but white. White overalls and head cowls may well become part of the civilian defense provisions.

These random observations are intended only to indicate that fool-proof shelters against atomic dangers are possible and should be planned without delay in areas subject to atomic attack. They seem to me suitable and urgent projects for municipal, state, and federal public works programs. In conjunction with an effective alert system, they promise to reduce casualties to a negligible fraction of those sustained by the unalerted and unsheltered Japanese populations.

Some of the shelters which I examined in Germany, erected in the last stages of the war, were perfectly immune to bombing, including direct hits by missiles up to two thousand pounds in weight. Those shelters would also have provided full immunity to atom bombing, except for direct hits. Retreats of this kind were built to accommodate the entire personnel of a factory building. As an additional precaution, they should be provided with a long underground tunnel. Thus even if an atom bomb exploded so close that the ground above became temporarily radioactive, the occupants could emerge at a safe distance.

There are protective measures the management of apartment houses, office buildings, even the individual family, can take. Atomic defense, like charity, begins at home. The atom-wise housewife will know in advance the safe or "blind" spots in her house, where neither radiation nor flash-burn can penetrate: a windowless corridor or a cellar, for instance.

New theaters, concert halls, sports arenas, and the like should hereafter be of massive construction, either underground or without windows, so that they could also do service as bomb shelters. They can be designed to accommodate tremendous numbers of people in an emergency. Underground passages connecting with subways would enable people to leave without fear of radio-contamination. Reasonable construction laws and regulations should require new large buildings to provide spacious cellars—perhaps designed to serve now as garages, indoor playgrounds, etc., to improve urban life, but available for instant sheltering purposes. Possibly the government could share the additional costs involved.

In private residences, a shelter outside or under the house is desirable, because of the hazards of fire and of walls collapsing from blast. A simple dugout will answer the purpose, provided it is fitted with an air-tight cover or ceiling of thick masonry. Lead, being most resistant to gamma rays, makes the most useful lining for such covers.

Many new American dwellings nowadays are erected upon a slab of concrete instead of the traditional foundation. If this slab is at least twenty inches thick at some point, a dugout under it will give immunity to blast, heat, and radiation. A simple manhole cover, lined with lead, located inconspicuously in some room or corridor and giving access to such a dugout, will in effect make a perfect one-family shelter as part of the house.

It is apparent that the American woman is destined to take a primary part in meeting the atomic challenge. The domestic preparations for atom-raid retreats are her sphere. Being at home, with radio and television at her disposal, she will normally be the first person alerted. Upon her cool head and steady nerves will depend not only her own life but the lives of those around her.

Moreover, skilled and swift first aid to victims will be more important than ever before. This responsibility will fall first of all on our women. They will have to learn in advance what needs to be done and how to do it, so that they can bring relief to their families and neighbors. The management of local shelters, too, is likely to be in the hands of local women.

The breakdown of normal provisioning is among the vital dangers inherent in a large-scale bombing. The deep-freeze will thus tend to become an item in the defensive preparations. Its proper stocking and the rationing of available supplies are clearly jobs for intelligent women.

Of course, upon emerging from the shelters people may find their home reduced to rubble or razed by fire. They will still be endangered by latent radioactivity, particularly close to the point of explosion. Geiger counters and more advanced instruments to indicate the degree of contamination, if any, will inevitably become a piece of everyday household equipment. Luckily they can be as easy to read as a watch or thermometer. Radio and TV sets can be made to serve as contamination warning devices through simple attachments.

ORGANIZED CIVILIAN DEFENSES such as firefighting, first aid, emergency housing, evacuation, public feeding, etc., on a national scale will add up to a vast undertaking. London under aerial blitz showed how much can be done to reduce the toll of death and suffering by timely and wise community effort.

The organization charged with planning and regulating this phase of defense will be large and elaborate, staffed by experts in many special fields and enlisting the collaboration of millions of volunteers. In the hour of crisis it would virtually regulate and control the lives of the mass of our population, unavoidably cutting into the freedom of the individual. The setup must therefore be kept strictly under civilian leadership—that is the logic of our democratic society—although in intimate liaison with the military high command. The head of the organization might be a member of the National Security Resources Board.

In local civilian defense organizations, it would be inexcusable if posts of leadership were treated as political plums. The lives of millions in our great cities will depend upon the personal abilities of the men chosen. Positions must be entrusted to experts who have the requisite experience and background, plus the personal prestige that will command confidence and intelligent obedience.

Fire being normally the greatest killer in air raids, fire-fighting techniques in all urban centers ought to be prepared to meet this special challenge. In studying devastated cities I observed that thousands of lives and much property were unnecessarily lost because fire-fighting vehicles and ambulances were blocked by debris and broken streets. Some arrangement for putting all such vehicles on caterpillar treads for emergency use seems feasible and well worth the investment.

In addition, fire-fighting machinery and ambulances ought to be housed in fireproof and bomb-proof structures, preferably located on large open squares, where they will not be bottled up by avalanches of rubble. Except for emergency units, the main fire-fighting and medical-aid facilities should probably be outside city limits, or beyond the vital target areas, to reduce the chance of their immobilization. They should be so deployed that they can converge quickly on the

bombed city and get to work. In Europe, as in the atomized Japanese cities, fire-fighting and ambulance vehicles were frequently destroyed along with the rest of the target.

Population centers located on rivers or lakes should be in a position to receive swift additional succor from seaplanes and amphibious aircraft, particularly for evacuation purposes. Flying ambulances and clinics deserve immediate consideration. Helicopters, too, will play an important role in rescue operations.

Detailed exploration of the needs and the possibilities of "passive defense" does not come within the scope of this book. But we may note in passing that radio and the fast-growing availability of television give Americans a real margin of defensive advantage. They will enable us to learn quickly how to protect ourselves and to keep abreast of any new means of defense. The last war proved that visual education is the fastest and most efficient method of training. Millions can be taught simultaneously by a single instructor how to use radio-activity detectors and other defensive gadgets, how to treat various injuries, how to improvise shelters.

In menaced areas the population can be given continuous guidance and instructions over the air waves. In case of large-scale damage to a city, maps flashed immediately on TV screens can indicate contaminated areas, detours, locations of first-aid stations, and the like. The use of short-wave radio telephones by private citizens in their homes and cars, and even miniature walkie-talkies, should be encouraged, so that the population is constantly in touch with the civilian defense authorities. In any emergency program for curtailing civilian production, television and radio must be regarded not as dispensable luxuries but as indispensable defense necessities.

In at least one respect cities under aerial attack in the future will differ from those in the past. There will be hardly any blackouts. Whether by day or night, future bombing will be done by radar and darkness will cease to offer protection. If electric power is switched off, the purpose will be the reducing of fire hazards through short-circuiting.

The insistence that there is no defense against the bomb is related to the erroneous popular conception of atomic war as a super-blitzkrieg to be decided in a matter of hours, or at most a few days. The

terrifying wallop carried in a single missile has focused people's thinking on the offense to the point of obsession. But this frantic state of mind is already beginning to wear off. The realization grows that this time, as always in the past when new death-dealing weapons have appeared, the defensive will in time catch up with the offensive. The human ingenuity which produced the offensive instrument will not be frozen at that stage; it will devise an equilibrium.

This is not wishful thinking, as anyone aware of the direction of military research in our country and other countries knows. The basic element in active defense, air mastery over the entire globe, is the message of this book. While that mastery is in the balance, each belligerent will gear to detect and stop the bomb-bearing airplanes before they reach their targets; he will perfect his machinery for instantaneously alerting the threatened area.

Where the offensive potentials of opposed nations are roughly in balance, the relative defensive potentials become decisive. Which is a formal way of saying that when the capacity to "dish it out" is equal, the nation best equipped to "take it" holds the upper hand.

The United States, as the world's most technologically advanced country, will enjoy distinct advantages. It is true that the physical assets of an industrialized nation are more vulnerable to bombing. But this handicap is more than balanced by our higher capacity for technological self-protection.

Defenses against high, fast-flying aircraft will have to function with the speed of electronics, which is the speed of light: 186,000 miles per second. The new jet fighters do not rely on human sight to locate and shoot at the enemy planes, but on automatic means and radar. Interception and anti-aircraft weapons will of necessity operate electronically.

In consequence of this, the defensive advantage will lie with a country densely covered with a network of electronic means: millions of miles of telegraph, telephone, and electric wires and conduits, elaborate radio and television networks. The mere statement of this truth attests our enormous advantage over a country like Soviet Russia.

America is virtually encased in a close-woven fabric of electric wiring and radio carrier waves that can be utilized for electronic de-



fenses without interrupting light, power, and communications. Despite its industrial progress, Russia remains comparatively primitive in this respect. It will be another generation at least before its gigantic spaces can be efficiently wired. Until then, gaping holes will remain in the Soviet electronic shield.

"The chief difficulty connected with radar detection of missiles directed at us in a future war," one expert warned in 1946, "would be that of separating the radar signals produced by such objects from those caused by friendly and normal air traffic. This calls for the development of an identification system of unparalleled effectiveness and subtlety. . . ."

Perhaps he underrated American ingenuity. Only three years later, in the course of the Congressional hearings on the B-36, it was disclosed that we already possessed "secret equipment" that distinguishes between friendly and hostile aircraft.† Millions in our armed forces were taught the art of aircraft recognition in the last war. Now science again replaces and surpasses human senses, furnishing us with instantaneous and infallible identification of friend and foe.

The erection of a dense radar screen around the United States will be a costly enterprise. In proportion to the total defense effort, however, it will probably be no more expensive than the picket fence of Coast Artillery protecting the periphery of the country was in relation to total defense effort in the old days.

Naturally the Continental Defense Air Force, like the Strategic Air Force, must be "in being" and geared to instant action. Its magnitude and lien upon national resources should be second only to the Strategic Striking Air Force. Its present arbitrary deployment, without specific reference to priorities of objectives to be defended, has become anachronistic. Funds should be provided for more rational deployment, critical industries and the strategic bases of our retaliatory intercontinental air force having first priority. At the same time the air units of the National Guard, heretofore an adjunct of the Army and equipped with tactical aircraft, should be reorganized as defense units of the Air Force; their intimate knowledge of the localities in which they would operate gives them an advantage that should be

\* *One World or None*, Louis Ridenour, page 38.

† Associated Press, October 10, 1949.

exploited. Not only aircraft but all types of aerial defense—warning radar stations, anti-aircraft artillery, guided missiles, etc.—ought to be unified in a single Command, under an airman in charge of the entire continental air defense.

In absolute terms the financial drain of proper defense will be heavy. Where is all this wealth to come from? No nation has the remotest chance of possessing adequate means for complete control of the air space above the enemy and over its own territory, and of generating the means for passive resistance, while continuing to pay for outmoded forces and installations on the traditional scale. From the angle of defensive necessities in the atomic age, we again reach the conclusion that we cannot afford the luxury of "balanced forces." To provide adequate air power and adequate defenses without bankrupting ourselves, we must devise strategy that boldly stops the heavy drains of supporting outlived and irrelevant military forces.

The economic facts of life can no longer be ignored in the military picture. The high cost of atomic warfare, in explosives and air power, has far-reaching implications. Our every defensive tactic—dispersion, bomb-proof construction, underground projects, electronic detection systems, etc.—will have to be paid for. At the same time they will oblige the enemy to use more atom bombs and aviation, to the point where his costs, in relation to results achieved, become uneconomic and in the long run prohibitive.

A nation prepared, with enough and the right kind of defensive means, geared to minimize and absorb atomic and other explosive damage, can force upon the adversary a rate of attrition in offensive action beyond his capacity. It will be a long time, I am convinced, before atomic weapons can be provided by any belligerent at a cost and in quantities allowing their use as lavishly as ordinary TNT and incendiaries can be used.

THIS IS perhaps a convenient place for brief comment on hysteria in another dimension: the forecasts of horror unlimited through disease or biological warfare. Even the panic-mongering on atomic destruction pales when the bacteriological prophets take over.

In theory a biological offensive can be outlined convincingly

enough, given an ample supply of creepy adjectives. Actually, such a weapon of terror could not impose surrender, and therefore would boomerang against the belligerent who unleashes it. The history of war-making shows that resort to such terror weapons comes, if at all, in the extreme of desperation. No country will commit its major energies and resources to the manufacture and delivery of disease germs—and such an effort on a smaller scale, short of the magnitude for victory, would be futile.

Before World War II, extreme claims were made for bombing with poison gas. It was said that poison gas from the skies would result in “ghost cities” and even “ghost nations”; also that such attacks would have the advantage of destroying people instead of things, and that an attack of that kind on a capital city alone would bring panic and precipitate immediate surrender.

Yet we saw no use of gas in the last war. Why? Certainly not because of humane scruples but because poison gas, for all its diabolical qualities, was not practical enough to exact surrender. It represented a highly inefficient exploitation of offensive power. Its target was human life, but destruction of life while a nation retains its physical instruments for waging war can never in itself bring a decision. War against people is an unprofitable undertaking. Only war against the means to make war pays high military dividends. Neither gas nor bacteria will be used as long as there are more economical methods for compelling an enemy to quit.

Bacteriological warfare through saboteurs can be discounted at the outset. It would necessarily be on a minor scale, readily localized and isolated. No nation would conceivably undertake this strategy except on a gigantic scale through the air. For this purpose it would need absolute control of the skies, as a guarantee that the victim nation would not retaliate with the same weapon. But if it controls the skies it has less barbarous and more effective ways of imposing defeat.

In most cases simple and effective countermeasures are available. And the United States would start with a substantial advantage in a bacteriological war by reason of its high standards of sanitation, hygiene, and medical service. The elementary facts of aseptics and anti-septics, commonplace knowledge for Americans, are still deep mysteries to the majority of Russians. In the Pacific war, our troops

exposed to fever-ridden swamps and jungle diseases suffered less from those unaccustomed perils than the natives of those areas.

Over and above the old and the new drugs, many new protective methods are on the horizon of preventive medicine, and their development would proceed at a swift rate with the first sign of biological warfare. Radioactive salts, ionized metals, and radioactive alloys will play a great part in the defense against bacteriological threats. According to some scientists, the entire water system of a city could be sterilized with ionized metal alloys. As always in the past, the offensive menace will generate techniques of defense.

I am not implying that we should be complacent about the possibility of biological offensive, no matter how remote. We were prepared to meet a poison-gas attack and to use it in reprisal. If we are similarly prepared for bacteriological warfare, the chances are overwhelming that it will never come.

As for the so-called radioactive "clouds" that supposedly will drench huge areas and destroy all life, they are another product of the hysterical speculation which confuses the theoretically possible with what is, as yet, highly improbable. The technical difficulties of shielding radioactive materials for producing such clouds are every bit as formidable as those that hamper the use of atomic energy for industrial and propulsion purposes. It is still highly problematical whether it would be possible to deliver by air the substances for generating radioactive clouds.

By the time such problems are solved, countermeasures are likely to have been developed. One such measure has already been suggested by Dr. Oleg Yadoff, a scientist formerly at the Sorbonne and now with Columbia University. He has devised a process for creating clouds of electrically charged particles; in contact with radioactive clouds, these will decontaminate them completely or at least reduce them to a non-lethal dose.

Even such a brief appraisal of our defensive capacity, both passive and active, indicates that if we force the enemy to fight on our terms—to accept air battle—we can attain decisive superiority.

## THE FALLACY OF KILLING PEOPLE

## 1

AFTER EVERY WAR popular revulsion against its piled-up horrors tends to brand as "inhuman" the weapons with which it was conducted. The societies whose greeds and blunders caused the war are inclined to take out their sense of guilt on the instruments of war-making.

The air weapon and those who wield it have been no exception. During the last war airmen were often reproached for the great destruction inflicted on belligerent nations by air power, and the proponents of aerial strategy were sometimes looked upon as especially callous practitioners of the trade of killing. The idea which then took root is that air warfare is a peculiarly brutal type of struggle.

The emotions which inspire the idea are admirable, but its logic leaves much to be desired. The greatest demonstration of traditional surface war in modern times was unrolled in Russia, the greatest application of air power in Germany. No one will contend that the sum-total of horrors—as measured in casualties, smashed cities, scorched areas, homelessness, and suffering—was any bigger in Germany than in Russia. As between Stalingrad and Berlin, as between Leningrad and Hamburg, there is little to choose.

Attacks on civilians are as old as the first raid on a village in primitive times. The bombardment of cities by armies, naval bombardment of populated coastal areas, the slow strangulation of entire nations by hunger and disease through siege and blockade—how do they differ in moral substance from aerial bombing?

All war is hell. To discuss the degrees of hellishness may sound cynical. But I believe that air power, *if properly used*, can be more



humane than the traditional surface forces. It does not—or at least it should not—seek to destroy the population of a nation. Its objective is to disarm the foe by crippling his industrial setup, fuel, transportation, and other military vitals. In this process large casualties are inevitable. But if the attack is competently planned and directed, loss of life on both sides is smaller than in the ebb and flow of great armies clashing on the surface.

When armies fight, the physical expunging of millions of soldiers' lives with guns and tanks, flame-throwers and poison gas, is the principal immediate task in clearing a road to the enemy homeland. In air battle, *killing is incidental to the strategic purpose*.

The more primitive a weapon, the more cruel it is likely to be. The death inflicted with a caveman's club is more painful and brutal than the one produced by a clean bullet through the brain. A military strategy that imposes surrender by direct blows at a nation's industrial heart is less savage than a strategy requiring systematic extermination of its armed forces to reach that heart.

In the past, in order to attain victory, we had normally to cut through the living flesh of massed millions. The advent of air power has made it possible to strike at the ultimate targets directly, over the heads of armies and navies, in disregard of geographical barriers, without putting the intervening territories to fire and sword mile by mile. Air power can seek out specific targets and demolish them most economically.

It has been said that air power is the force of "mass destruction" and the havoc wrought in Germany is adduced as evidence. The charge has in it an element of truth, insofar as unnecessary, clumsy, strategically futile bombing was applied in the early years. It is a charge, however, that could be addressed with equal justice to militarily unwarranted mass destruction by naval guns and army artillery in this and other wars. The alleged brutality *is not inherent in the weapon*. It is usually the result of unskilled and unwise use.

It should be remembered that the last war offered few examples of pure air strategy. In the main, belligerents used aviation as an auxiliary of their surface forces. The destruction piled up therefore represented a total well above the normal amount dictated by air strategy. Genuine aerial warfare, the kind that is geared for a decision through

the neutralization of an enemy's war-making capacity, should involve a minimum loss of life for attackers and defenders alike.

In the bloody struggle for islands and atolls in the Pacific, conducted at the same time on sea and land and in the skies, every inch of beach, every coral crag was paid for with heavy casualties. Names like Tarawa and Iwo Jima and Okinawa connote death and horror. Consider how many American and Japanese lives would have been spared if we had prepared to mount a direct, concentrated aerial offensive on Japan proper from the outset.

Air power happens to be an extremely technical force. Used by those who understand its laws and limitations, it can accomplish its purpose with a minimum of damage. A good shot can put his bullet through the vital organ of an animal and save its pelt, where an awkward marksman will mutilate the beast in the attempt to subdue it. Though air power was applied in action by skilled airmen, its role in the larger scheme was largely defined by minds untrained in the arts of aerial warfare. Small wonder that their methods and choice of military objectives proved so destructive.

Because we conducted war in all three elements simultaneously, it became necessary to attack the enemy's means of waging war in all three elements. Air power was called on to destroy the sources of his sea power, land power, and air power. What was once said of Napoleon can be paraphrased for the Allied leadership suddenly faced with air power. They had "no notion of the motion in the air ocean." Consequently, they ordered air power to destroy anything and everything related to war on land and on the high seas, and enemy morale as well.

In the eyes of history, the methods of the last war—including a considerable amount of unwarranted bombing—will be revealed as transitory. Air power was not permitted to assume its proper strategic role until the very end, and we continued to mass for showdown battles on the surface. The result was strategic confusion and waste.

Future wars should be increasingly a contest in the annihilation of weapons at their point of origin, rather than a contest in mutual slaughter. Industrial potentials, not human beings, should be the primary targets in bombing. In the hands of civilized, technologically advanced countries, air power can be the most humane of all military

forces. The availability of the atom bomb changes nothing in this respect—unless it is misused by an uncivilized nation lacking necessary skills, without moral inhibitions and bent on annihilation. In that case, the new explosives may indeed compass the end of civilization.

As precision in picking out and erasing selected strategic targets improves, the toll of life will be reduced. Mass destruction will cease to be mistaken for a strategy; it will be realized that more often it is proof that the attacker does not have a strategy.

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ENEMY MORALE is of course a proper objective in any kind of warfare. The mistake is in supposing that it can be destroyed by just killing people, by sheer bombing.

Soon after America entered the last war, I formulated this thesis: "Destruction of enemy morale from the air can be accomplished only by precision bombing." Though available evidence was still meager, it seemed clear to me that civilian populations could "take it." The general assumption that aerial bombardment would quickly shatter civilian morale proved unjustified. People under sky-fire adjusted themselves to the dangers and the sacrifices more readily than had been foreseen. On the whole, indeed, armed forces have been more quickly demoralized by air power than the unarmed city dwellers.

Important military conclusions could be drawn from these facts: "They mean that haphazard destruction of cities—sheer blows at morale—are costly and wasteful in relation to the tactical results obtained. . . . Unplanned vandalism from the air must give way, more and more, to planned, predetermined destruction." \*

Partly because we had not provided the means for precision bombing, and more so because of wrong decisions, people were too often regarded as targets. In early 1942, according to Air Marshal Lord Tedder, "Bomber Commands were given the directive specifying the principal industrial sites of the Ruhr as first priority targets, the operations to be focused on the morale of the enemy civil population and in particular on industrial workers." This Lord Tedder described as

\* *Victory Through Air Power*, page 145.

"a common-denominator target system . . . the enemy war industries were to be attacked by demoralizing the workers." ■

Assuredly orders of this kind did not originate with airmen. I was not alone among them in pointing out repeatedly that morale cannot be undermined by attacking people directly, but only by depriving them of the means of normal existence and in particular the weapons for defending themselves. We believed that air action against human life was a misdirection of effort. Yet the directive that emerged from the Casablanca conference in January, 1943, where aviation leaders played second or third fiddle, read as follows:

"The air ought to be employed for the destruction and dislocation of the German military, industrial, and economic systems and the undermining of the morale of the German people to the point where their capacity for armed resistance is fatally weakened."

Not a word about the *Luftwaffe*, which air-power specialists insisted should be given number one target priority. Right or wrong, it was a directive which Allied air power did not have the magnitude to carry out. What it demanded was the destruction of the German industrial potential as a whole, the wrecking of German civilian morale as a whole. To accomplish this would have called for an aggregate of explosive tonnage we could not conceivably deliver in any case.

Air force will cease to be a weapon of mass annihilation just as soon as it is directed by airmen in the implementation of air strategy. The loose talk about "wiping out Russia with atom bombs" comes from angry civilians or from military men who have little inkling of the true possibilities inherent in air power. Air power is the firearms of the twentieth century. It makes possible a decision by piercing the vital organs of the enemy nation, instead of butchering millions of bodies on both sides.

A major effort to destroy people, even if it were militarily justified, is likely to fail. The human animal, being endowed with reason and cunning and an intense instinct for self-preservation, is not easily killed. The high casualties in Hiroshima and Nagasaki are misleading; they represented the victims of a total initial surprise which can never again be repeated.

Besides, when we speak of morale we refer to the state of mind

\* "The Exercise of Air Power," lecture, Cambridge University, 1947.

of *survivors*. The experience of the last war has proved for all time that man's capacity for absorbing suffering without breaking is almost infinite. London and Berlin, Leningrad and Tokyo, should induce the advocates of random mass bombing to reconsider their views.

There is another fact rarely noted. Quite aside from humanitarian considerations, it is militarily advantageous to avoid outright killing of people in enemy countries. After all, corpses can't revolt, but millions of living people whose everyday existence is shattered as a result of systematic bombardment contribute to the general chaos, undermining morale and hastening the collapse of resistance.

This is especially true in totalitarian countries, where human life is the most expendable of all resources. Mass extermination which leaves the Kremlin's power to make war unbroken would scarcely disturb rulers who have not scrupled to exterminate millions of their own subjects to put over an economic change—like collectivization of agriculture. The regime has to be *disarmed* through the elimination first of its air power, then of its decisive industrial means. Only then will the people, soldiers and civilians, perhaps turn on their government, which will have shown itself incapable of defending them and will have shed its aura of invincibility.

If a Russian industrial complex were destroyed along with its workers and their families, the blow would be far less serious for the Soviet government than if the workers and their families remained alive. Those idle people would have to be fed and clothed; as their numbers swelled, they would become more and more of a weight on the regime and a threat to its survival.

Both as ethics and as strategy, therefore, we can and should make it clear that we do not aim at the annihilation of human beings. From this it follows that we should, wherever feasible, warn enemy populations of impending bomber offensives and give them every chance to survive consistent with success of the missions.

IF FORCED into war, our purpose should be to compromise the enemy regime by exposing its inability to defend and supply the needs of



its people. A valid objective in any war, this applies in particular to a police-state like Soviet Russia which dominates its population by psychological and physical terror. No doubt should be left that our attack is directed not against the inhabitants but against the leaders and their system of government.

Not long ago a military man asked me in all seriousness "how many million Russians we must kill to make them quit."

"I don't believe we can win wars by killing people," I replied.

He seemed taken aback by this statement. "Suppose we kill all two hundred million of them," he argued. "Wouldn't we be the winners?"

I had to agree that he was right, but hastened to point out that we Americans certainly would not attempt any such savagery on moral grounds, and that in any event we could not accomplish it.

"All right," he bargained, "suppose we eliminate only ten million Russians."

"If the industrial war-making vitals of the country were not paralyzed," I answered, "the death of ten millions would not bring surrender. It would, therefore, be purposeless in the military sense. Worse, it would raise the mood of resistance, the will to fight. The effort would thus represent not only an immoral but a strategically stupid misuse of our aerial potential."

The fallacy of mass bombing on an indiscriminate scale seems to me one that airmen in particular must help eradicate.

In past wars the purpose was usually to undermine the enemy country's position as a competitor in world markets; to take away its colonies or home territories; to reduce it from a great to a minor power in the international political pattern. In greater or smaller measure they were wars of aggrandizement and exploitation.

World War II was more complicated in its character. The primary enemy was a Nazified Germany, exponent of a new type of human society openly seeking to impose itself on the whole world as a "superior race." That meant we were engaged in a struggle not so much with the country or with the German people as with the Hitler regime and its complex of power. It was to that extent an ideological war. But two elements of confusion entered into the picture: at least one of our allies had old-style territorial goals, and, more important, this ally was a great totalitarian power.

In effect three ideologies were thus engaged in the strange and rather unnatural alignment of forces: on one side Fascism, on the other Democracy and Communism. Should there be another war, no such complexities are likely to develop. The main contenders will be Democracy on one side, totalitarian Communism on the other. For the first time since the great religious wars of the past, it would be a fairly clear-cut ideological contest.

The implications of this fact are deep-reaching. It means that we would not be at war with Russia as a nation nor with the Russians as a people—but with Communism as a system of power. We shall not be committed to eliminating Russia as a nation but to making it into a co-operative, non-aggressive nation. Our purpose would not be to bleed its people, but to liberate them from a hateful and hated tyranny. We would have no goals beyond ending the threat to civilization represented by Communist methods and ambitions.

We have no way of judging accurately how large a part of the inhabitants of the Soviet sphere would sympathize with us, but certainly their number runs into scores of millions. The vast hordes of political prisoners and slave laborers in Soviet concentration camps, the scope of police terror, the extent of desertions from the Red armed forces, the hundreds of thousands of Soviet citizens who refused to go back to their homeland after their country's victory in World War II—these are a few of the indications that a large part, at least, of the Soviet peoples hate their government.

These would be our allies in their hearts, even as Stalin's followers in the United States and other democratic countries would be his allies in their hearts. American political and military strategy alike should take cognizance of these potential allies and leave no stone unturned to expand their numbers. It should take into consideration that virtually the entire population in the non-Russian lands held by the Communists would regard us as liberators. Atom bombs wrongly applied may actually do us irreparable harm, if they operate to rally the Soviet and satellite masses around the dictatorship.

It is by this time fairly common knowledge—though during the war it was kept more or less secret—that the German invaders of the Soviet Union in June, 1941, were at first welcomed by a large part if not most of the Soviet people. The *Reichswehr* was able to gather in

millions of war prisoners in a few brief months because the Red Army fought half-heartedly. Hundreds of thousands of these prisoners consented to fight on the German side against their own country in the hope of overthrowing the Communist regime. Hordes of Russian civilians in the first stages rushed to volunteer to work with the German conquerors.

But it did not take long for the Soviet peoples to realize that the Germans were there not as liberators but as slave-masters. Quickly enough they learned about the brutality, the race arrogance, the barbarism of their uninvited guests. Hitler, convinced that only force counts, did nothing to meet popular Russian hopes for economic and political freedoms and for self-government. And so the initial friendliness changed rapidly into deadly hostility. The people in the main rallied around Stalin as the lesser of the two evils, preferring their own to foreign oppressors. Even at that, huge numbers of partisans in the Ukraine and other areas continued to fight against both the Reds and the invaders.

It may be said with some justice that Hitler saved Stalin by merely behaving like Hitler. Had the invaders been of a different human and political stripe, had they been truly interested in defeating the government rather than crushing and chaining the country, the outcome might have been different.

THIS HISTORICAL BACKGROUND holds valuable lessons for us. The worst blunder we could make would be to ignore the gulf between the Soviet regime and its subjects; to treat them in our thinking and planning as if they were one and indivisible. A strategy of indiscriminate destruction would amount to a repetition of Hitler's mistake in driving the peoples of the U.S.S.R. to all-out resistance.

The way of wisdom would be to widen that gulf by every psychological procedure we can devise. Even now, in the cold war, everything possible ought to be done to convince the average man behind the Iron Curtain that America and the democracies in general have no quarrel with him but only with his totalitarian bosses. Certainly we should be minutely prepared to bring this knowledge to him the moment that a shooting war breaks out.

I know the Russian people as only a man of Russian birth and background can know them. I have talked at length with recent fugitives from their country, as well as with foreigners who have lived and worked there since the war. There is no doubt in my mind that the great majority of Russians have a deep admiration and fellow-feeling for Americans. They sense that the two great peoples have a great deal in common. Only artificial iron curtains prevent the forging of friendly and peaceful bonds between the two nations.

Nearly all Russians are profoundly conscious of America's superior technology. Their dictatorship has held up American methods and "American tempo" as shining goals in the Five Year Plans. During the war the Soviet peoples saw the products of American industrial ingenuity. They cannot look complacently on the possibility of a showdown with this superior nation. Somehow, at any cost, we must make them aware that such a showdown is unnecessary and that, if it is forced upon them—and us—by the Kremlin, American victory is inevitable.

I came to the United States more than thirty years ago and quickly learned to love it, to treasure its free way of life. I am eager for other peoples—and especially my Russian brethren—to share these blessings. Like nearly all my fellow-Americans, I cherish the hope that the potentials of American civilization may one day be made accessible to the Russians on the basis of a free, friendly, mutually helpful interchange. And I have no doubts that the great mass of Russians share this hope. We must let them know that our goals are peace and co-operation; that if driven to fight we shall aim to free them from the chains of their dictatorship.

We should not underestimate their essential good sense. Russians have never forgotten the generous famine rescue work done by the American Relief Administration under Herbert Hoover in the early nineteen-twenties; nor the gigantic assistance delivered to their hard-pressed country in the last war. We must come to them, even in war, as friends. We must so conduct the struggle if it is forced upon us as to confirm and fortify the Russian preconceptions of Americans as highly civilized and decent human beings.

What has all this to do with air power? To begin with, the frontiers between strategy and politics, always uncertain, tend to disappear

when a war is largely or entirely ideological. Secondly, air power happens to be a flexible weapon, as significant for psychological as for military offensive.

If command of the skies over the Soviet domain will enable us to kill Russians, it will also enable us to win their friendship and collaboration. Our whole pattern of destruction should be designed, as far as possible, to isolate the government from its subjects. Through pinpoint demolition we shall destroy the regime's radio broadcasting facilities, while enlarging our own. As insurgent groups and guerrilla contingents develop in the Soviet area, they can be supplied from the skies with arms and where necessary with military and political leadership.

Air power alone cannot supply, cannot provide the logistics for ground action on a colossal scale on another continent. But once we exercise sky control, it will be possible to land Marines and air-borne divisions in regions where anti-Communist forces have obtained the upper hand. Such forces, working with the local guerrilla troops, can be continuously supplied and supported by airlift.

The destruction of Red military power would be pressed to the limit at the same time. The Kremlin's means for making war, its fuel, its transport, its electronic centers, would be eliminated. But the whole process should be planned and selective, sparing life and preserving the facilities essential for an early restoration of normal existence.

The conquest of the skies through the defeat of Soviet air power is the condition for success in any case. Our strategy and equipment must be in line with that supreme objective. How we choose to exploit the freedom of the skies thereafter—the proportions of military and psychological action—will be, I believe, a test of our national maturity.

In case of war, a historical task, over and above its military functions, will devolve upon the American Air Force. It will be the one that makes the first and the most sustained contact with the people of Russia. To a large extent the outcome of the struggle may be influenced by the behavior of this force—by the way in which its strength is tempered with consideration for the innocent. The need to shorten the struggle by winning over more and more of the Russian people—



the determination not to "lose the peace" again as we did in World War II—should figure importantly in our overall plans.

The moment that a shooting war comes, the Iron Curtain will be pierced by our aviation. Psychological war will be recognized as a vital, in some respects the most vital, phase of the offensive for victory. Fortunately the primary military force of our epoch also opens up magnificent possibilities for this phase of the combined operations. No longer restricted by diplomatic barriers, we shall not only call upon all subjects of the Soviet empire to revolt but will help them do it. For example, literally millions of radio receiving sets could be dropped throughout Russia and Soviet-held territory, so that the Voice of America could be heard by these people.

I do not want to be misunderstood—I am making no futile claims of "bloodless" wars. I am not unduly squeamish about imposing casualties on an enemy to win a war, nor do I agree with the belated discovery by some Navy men that bombardment is "immoral." My point is that the killing of people in itself is neither a necessary nor a decisive objective. No matter how any future war is fought, it will exact a more tragic toll in life than any in the past. The element determining victory, however, will not be the destruction of *life* but destruction of *substance*.

We must utilize to the maximum the unique ability of air power to destroy all weapons, no matter in what medium they are designed to operate, by bombing before they are "born"—while they are still in the incubating stage at the point of production. Air power can deal effectively with a submarine yard or a tank factory or an aviation plant. But once these plants are allowed to "hatch" their weapons and spread them throughout the world, interception and destruction become tremendously more complicated and costly. The advantage of attacking the breeding places is therefore apparent.

On the basis of the experience of World War II, it was possible to state that "attack against human beings, who are mobile and intelligent, is infinitely less effective than attack against inert things." \* To mount an offensive against millions of people would be a strategic blunder, a political blunder, and in any case beyond our physical capacity. This is not sentimentality. It is hard-headed military sense.

\* "We're Preparing for the Wrong War," by the author; *Look*, December 9, 1947.



1. Three identical eggs hatch creatures that live in water, on land, and in the air: let us say an alligator, an ostrich and an eagle. To deal with them after they have spread through their respective elements, various appropriate weapons have to be designed to track them down and destroy them one by one.



2. But while they are still in the incubating stage, all three can be destroyed with equal efficiency by a single weapon—let us say—a brick.



3. The eagle can attack an alligator if it shows its head above water; it can overtake and attack an ostrich; and it can fight another eagle. But neither the alligator nor the ostrich can challenge an eagle; they can merely defend themselves or try to escape.

THUS THE supremacy of air power would seem to flow from nature itself. It is the only strategic force that can carry war to the enemy by



4. Three identical factories produce weapons for forces operating in different elements—sea, land, and air: say submarines, tanks, and planes. To deal with them after they have been deployed through their respective elements, various counter-weapons must be designed to track them down and destroy them throughout the world.



5. But while still in the “incubating” stage in their factories, all these weapons can be destroyed with a single instrument: a bomb.



6. As in nature, air force can attack and engage at will both tanks and submarines, and of course it can fight opposing air force. But neither land nor sea force can take the initiative against air force. At best they can merely defend themselves or try to escape.

its own direct and independent action. Like the eagle, it enjoys the initiative of action against anything glued to the earth’s surface.

Certainly the kind of mass or "morale" bombing that was unloosed against Germany in the earlier stages of the air offensive—as analyzed in the next chapter—should not be repeated.

Air power, like sea power in the past, aims to impose a blockade on the enemy area. Navies could put a noose of steel around an insular nation; air power can clamp a lid over a self-contained continent with the same suffocating effect—by destroying its *interior* lines of transportation and communication and its vital means of existence. To hasten a break in morale, to create a sense of the futility of further resistance, the tri-dimensional blockade must be maximally effective. When control of the air is assured, no effort should be diverted from this job of destroying essential physical targets, rather than human lives.

## THE BOMBING OF GERMANY

## I

THE ATOM BOMB did not revolutionize war-making, but it did dramatize the revolution in war-making inherent in air power. Hiroshima and Nagasaki helped people grasp the implications of war through the third dimension. But taking their cue from confused scientists and journalists, a good many people credited the military revolution to the novel bomb instead of the new military force.

It is as if a searchlight suddenly revealed to observers a startling sight until then shrouded in darkness, and they treated the sight as though it were an attribute of the searchlight. Actually it had been there all the time; persons with sharper eyes had seen it and proclaimed it and been stoned as fanatics for insisting it was there. Operation Crossroads, the title applied to the Bikini atom-bomb tests in 1946, actually took place forty-three years earlier at Kitty Hawk. It was there, when man conquered the air and opened up a new method of carrying war to an enemy, that humanity found itself at the real crossroads. The atom explosions merely revealed to the whole world a revolutionary condition that had been perfectly apparent to a Billy Mitchell, let us say, a generation earlier.

At the same time, unhappily, the destructiveness of the new explosive has encouraged a fallacy at the other end of the scale: the belief that war can now be won by sheer bombing—by “bombing alone.” Many who denied the possibility of winning war through *air power* when a TNT bomb was used, now go to the other extreme of insisting it can be won with *bombs only*, when the missile is atomic.

I know that I have been persistently linked with the proposition of “bombing alone.” It may even come as a surprise to some readers that I disown it. Few diatribes against “extremists” have not made the assumption that I favor all-out, indiscriminate bombing. The plain



fact, however, is that from the First World War to this day I have sought to make clear to the public the vital and oft-confused distinction involved. My contention has been that *air power alone* can impose surrender on an enemy. I have explained to the point of boredom that the goal of air power applied strategically is *not* bombing as an end in itself but *conquest of the air*, in which bombing is an incidental procedure. Once a nation has stripped its adversary of air power, obtaining the right of way over his territory, bombing follows as needed to confirm the victory and enforce surrender.

In the last war there was a spate of books and articles by air-power champions, usually amateurs, who promised painless victory through bombing alone. Their plans followed the same too simple formula. They divided Germany into so many target areas, then prescribed so many tons of explosive per area. As bookkeeping it always balanced. As strategy it never balanced, because it omitted or minimized the all-important struggle for access to the targets. They merely skipped the indispensable preliminary of winning mastery of the medium through which the explosives must be carried.

For instance, Francis Vivian Drake, in his book *Vertical Warfare* (1943), proposed an air plan in which British-American air forces could "bring Germany to her knees" in "between four and six months." He divided his offensive plan into two phases of two months each, together employing 8,660 bombers including replacements. They would drop 240,000 tons of bombs in those four months, losing 1,660 planes and 20,000 airmen. He clinched his proposal with the assertion that "it is outside of the realm of possibility that the population of any country, no matter how determined or how desperate, could withstand anything like such a terrible tonnage as 240,000 tons of bombs in such a short interval"; that "no people, no industrial system could withstand the proposed assault. . . ."

Actually, we had to use not only bombers but long-range fighters, which he did not mention. According to the U.S. Strategic Bombing Survey, the peak strength reached by our air forces at any one time was almost 28,000 combat planes, out of which more than half were bombers. Our aggregate losses were some 40,000 aircraft, half of them bombers. We unloaded 2,700,000 tons of bombs (85% of which were dropped after the publication of Mr. Drake's book). In the one month

of March, 1945, we delivered 260,000 tons—more than the entire Drake schedule for four months. To do this we had to pay a cruel price of 160,000 airmen lost in the course of the European war.

How could airmen like Mr. Drake be so far off in their estimates? The answer is very simple. Like some airmen today, they overlooked the most crucial element of modern war—*air battle*. The difference between the Drake estimate and reality represents largely the cost of command of the air.

The advent of the atomic explosive has given a fresh impulse to that kind of oversimplification. There are those who calculate the number of vital target areas in the Soviet Union, for example, prescribe an atomic stockpile to match, and present their brows for the laurels of victory. Though most air strategists, then as now, fought against such concepts, we were widely accused of planning to win the last war in that fashion. Now, in retrospect, we are blamed for the alleged failure of the very thing we opposed.

Germany, we are told, was subjected for years to area bombing, morale bombing, saturation bombing—but neither its industry nor its morale caved in. In a concerted attempt to discredit strategic air power, critics in England and the United States quote the U.S. Strategic Bombing Survey to the effect that between 1942 and the fall of 1944 “Germany’s military output in aircraft weapons and ammunition was raised more than threefold, in tanks nearly sixfold” in spite of heavy bombing; that Hitler’s “aircraft production doubled from December, 1943, to July, 1944,” and so on.

They do not pause to inquire whether our bombing was the kind envisioned by proponents of all-out air strategy; whether it utilized the proper equipment and maintained the requisite continuity of action. And they gloss over the conclusions reached by the same Bombing Survey from which they quote isolated facts and figures. Having analyzed the air action in the European theater, the Survey offers this general finding:

Allied air power was decisive in the war in Western Europe. Hindsight inevitably suggests that it might have been employed differently or better in some respects. Nevertheless, it was decisive. In the air, its victory was complete; at sea, its contribution,

combined with naval power, brought an end to the enemy's greatest naval threat—the U-boat; on land, it helped turn the tide overwhelmingly in favor of the Allied ground forces. . . .

The German experience suggests that even a first-class military power—rugged and resilient as Germany was—cannot live long under full-scale and free exploitation of air weapons over the heart of its territory. By the beginning of 1945, before the invasion of the homeland itself, Germany was reaching a state of helplessness.

“Full-scale and free exploitation of air weapons” is precisely what Allied air power did not enjoy, until the final stage of the struggle. Such exploitation calls for command of the skies, through the neutralization of the enemy's air forces. Had that been made the chief goal, had it been attained two years earlier, the European war would undoubtedly have been finished sooner and with a great saving in both Allied and enemy lives.

The failures charged against strategic bombing were in the final analysis direct results of fallacious use of the air power available, made worse by limitations on the quantity and quality of equipment. The actual employment of air power in the theater of operations was in the hands of airmen who on the whole acquitted themselves well. But the strategy was dictated by a Combined Chiefs of Staff in which airmen had only a minor role and which employed the air potential for “softening” purposes in line with its main surface strategies.

Those who conducted the war were faced with a new strategic force which they had not taken into consideration in their planning, a force wholly alien to their training and natures. Until the last year they tried to squeeze the airplane into their old strategic molds. The air actions they ordered were not aimed at the primary objective—the elimination of German air opposition—but at general industrial and morale objectives of value to the land and sea struggles under way. The aerial phase was a sideshow, managed by those who ran the main show and for the most part in the interests of the main show.

*Europe and Germany provided no conclusive tests of the efficacy of all-out air strategy, simply because the war was not planned or fought that way.*

It is not a matter of "blaming" anyone but of understanding what happened. Men reared in one kind of military thought do not change over automatically. Long before the war started, Allied planners had committed themselves irrevocably to a surface strategy. No more than a slight fraction of the total investment went into air power, and an even slighter fraction of the technological possibilities open to aviation was utilized.

If there is any "blame" to be dispensed, the lion's share should go to the American people and their elected representatives. They had, so to speak, hired coachmen to take command of automobiles only to discover that horse sense does not make automotive sense.

Not until the end of the fourth year of the war—at the Quebec Conference in August, 1943, when arrangements were made for an ultimate invasion of Europe—did air power get a relatively free hand in the choice of target priorities. Even then the Allied leadership did not consider taking command of the air over the Continent as an end in itself—to be exploited to the point of victory—but simply as an indispensable condition for the great invasion.

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THE AUTHORS of the Bombing Survey are too amiable in stating that only "hindsight" reveals mistakes in the use of our air potential. Some if not all of the blunders were fairly obvious to many airmen at the time. Early in 1944 I had pointed out in a press dispatch that "air attacks on Germany, though they looked like pure air strategy to laymen, were in fact largely auxiliary or diversive actions planned primarily to support surface operations elsewhere." \*

Our strategic air forces, for instance, were ordered to bomb submarine bases; or they were instructed to bomb truck factories outside Paris, great ammunition plants, tank works, etc. Although these were important undertakings, their primary purpose was "to help us maintain command of the sea, to deprive the enemy of vital weapons for the African or Russian campaigns, or in some other way to assist distant engagements elsewhere." By 1944 it had become apparent that this had "left the sources of German air power unmolested," enabling

\* McNaught Syndicate, February 29, 1944.

the enemy to build up the powerful air defenses which made our air attacks so costly.

In that same year I had summed up the four underlying causes of what critics are now, in retrospect, describing as the failures of strategic bombing: ■

1. We entered the war with inadequate air power, and with planes unsuited for genuine air combat.

2. We funneled our resources and manpower overwhelmingly into surface weapons, giving aviation an increasing but always minor share.

3. We diverted the major portion of our aviation potential to tactical, auxiliary, and transport uses all over the world in support of Army and Navy strategies, leaving only an insignificant fraction for true aerial strategy.

4. When finally we came around to using air power in its own sphere we not only had a force smaller and inferior performance-wise to what we could and should have provided, but we were late; the Germans had used the years of delay to step up their defensive might.

The history of the B-17, our main air weapon against Germany, provides almost a digest of American fumbling and delays in the use of aerial force. The original concept of this plane was a great tribute to the foresight and strategic vision of men like Generals. Frank Andrews, Robert Olds, Hugh Knerr, Harold George, Kenneth Walker, "Tony" Frank. In the years before the war, it was the only plane in the world embodying the concept of true air strategy. But by the time it went through the wringer in Washington, it was stripped of its strategic vitality.

As a result, the B-17 entered the contest practically unarmed, with its pitiful thirty-caliber machine guns flapping in the slipstream. Those responsible for this blunder clung to their errors until forced to act by ghastly losses and an outraged public opinion. Armament was added slowly, piecemeal, without a clear grasp of the problem.

When it was decided to turn the plane into a genuine Flying Fortress, it should have been clear to any layman that firepower was needed to meet attacks from any and all directions. Yet we started by installing only tail guns, because flocks of B-17's had in the past

\* *Ibid.*, May 14, 1944.



been shot down from the rear. At that point we began to lose bombers through assault from below, so we proceeded to add underbelly ball turrets. The Germans, naturally, shifted to frontal attack, whereupon we installed the so-called chin turret, firing forward. Instead of military foresight, we were relying on a primitive process of trial and error, at a heavy cost in lives, planes—and time.

True, in the end the B-17 was transformed into a real man-of-war; supported by fighters it quickly gained mastery of the skies. But by that time the war was nearly over. The fault was not with air power, as critics now proclaim, but with the men who planned and implemented the new force.

The aeronautical industry, like the commanders in the field, was limited and frustrated by decisions in high places. With rare exceptions, our aircraft manufacturers not only worked to the best of their great abilities but used all the influence they could muster to raise combat standards in equipment.

Those airmen who feel constrained to defend the aerial phase of World War II *in toto* really do the air-power thesis more harm than good. We all know that great mistakes were made on the strategic level in applying air power and on the tactical level in implementing its use. If we fail to face and analyze those mistakes, air power as such will continue to be blamed for failures that certainly are not inherent in this force.

The fact is that air power never had a real chance in Europe. It was wrongly conceived, inadequate, continually dispersed for a variety of secondary tasks wholly unrelated to its strategic use. At Casablanca the directive issued by the Combined Chiefs was that the air power which could be spared from its role in support of Army-Navy strategy should be applied against enemy morale. But under the basic principles of warfare, the enemy's military forces—in this case his air force—constitute the number one target.

The bombing statistics of the Survey report reflect the misuse of available air force. Of the 2,638,000 tons of bombs dropped on Germany and German-held countries other than Russia, only 48,000 tons—less than 2%—were directed against aircraft factories; 640,000 tons were applied against “industrial areas” in general, meaning for the most part large cities, or morale targets. The principal objectives were

cities and people, and, secondarily, industrial and transport objectives of direct concern to the Army and Navy strategies.

Not until the spring of 1944 were airmen given ample authority to direct the Battle of Germany in conformity with their own principles. Though their task was made infinitely more difficult by the long delay, they did achieve that "complete victory" in the air attested by the Survey.

Fortunately the overall Air commander in the European theater was General "Tooey" Spaatz, a man with a brilliant record in World War I. Always he held clearly in view that the number one objective was to knock out the *Luftwaffe*.<sup>\*</sup> Though deceptively soft-spoken, General Spaatz had the courage to make his vital decisions in accordance with this purpose. To him the country is in largest measure indebted for the fact that this goal was finally reached, despite all handicaps.

The charts in the Survey report show graphically that bombing of aviation factories did not begin in earnest until the middle of 1944. Its scope was negligible compared with area bombings which, moreover, had been undertaken as early as 1941 and had attained immense proportions by mid-1943. The *first* aerial assaults on hydrogenation plants (synthetic oil), the life-blood of Hitler's air power, were not launched until May 12, 1944. Even then, the action was not followed through, thus violating the law of continuity of action. By the time our bombers returned to Leuna, the main hydrogenation target, its defenses had been increased from 46 to 487 large 88-mm. anti-aircraft guns.

Political considerations were contributing factors in disrupting continuity of action and dissipating air effort. An example is provided by the operations tagged with typical American humor as "milk runs." Often, after we had sustained heavy losses over a target, we let that target alone, attacking instead irrelevant and lightly defended objectives, practically without losses. This of course helped produce a better monthly box score for public consumption, giving the impression that we were hitting the enemy with relative impunity.

When we finally returned to the original target, defenses were

<sup>\*</sup> In this connection, see letter from General Spaatz, in Appendix.

usually greatly intensified. This required more "milk runs" to dilute the disaster, in an endless circle that sapped our air strength and postponed the decision. I for one did not believe that America needed phony "pacifiers." Had the air forces been properly equipped for battle, had crucial targets really been knocked out, combat personnel and American opinion would have understood the high costs and applauded the effort.

So there is ample evidence that the Allies made mistakes and suffered failures in their air action over Europe. But it was the first time in history that air power was used on a substantial scale. Many of the procedures were frankly experimental, and most were ordered in the interests of the main surface strategy.

In effect the Allies sought—with insufficient means, without the required concentration, often at random—to apply "bombing alone." It was evident to many airmen at the time and is fairly clear to everyone now that the attack should have centered on the *Luftwaffe* (including its industrial, fuel, and communications background) in the air and on the ground, with command of the entire air space as the goal. After that job was done, other types of bombing could have followed to exploit the triumph.

"The greatest single achievement of the air attack on Germany," the Bombing Survey declares, "was the defeat of the German air forces." But that defeat was accomplished almost as a by-product of other objectives. It came so late that the possibilities for exploiting the victory were never fully demonstrated. But it is significant that the present charges of failure of strategic air bombing rest on the record *before* air superiority was nailed down. Even the loudest critics admit that invaluable military advantages followed afterwards.

Only after Hitler's transportation was smashed from the air, they usually declare, did his industry begin to collapse. In this they follow the Survey conclusion that "the attack on transportation was the decisive blow that completely disorganized the German economy." But it does not occur to the critics, somehow, that the attack on transportation did not have to wait until the last stages of the war.

In judging an experiment, we must learn from fumbling and defeat no less than from success. The blunders and shortcomings in the

first large-scale application of air power do not discredit the new force. They only vindicate the view that command of the air is the prerequisite for victory through air power.

That command cannot be taken for granted on the basis of temporary advantages in numbers, equipment, or types of explosives, and I do not exclude the atom bomb. It must be fought for and won with blood and sweat. The American air command in Washington held the erroneous theory that the combat phase could be skipped. That error was behind the refusal to provide our bombers with escort fighters. Recent propaganda to discredit air power deals for the most part with the consequences of that underestimation of the combat phase. But the misguided desire to by-pass the enemy air power instead of defeating it was a failure of leadership, not of air power.

"The destruction of enemy military forces," General Clausewitz said, "is the chief objective of the whole act of war." A naval fleet makes the tracking down and demolition of the enemy fleet its first order of business. What happened at Trafalgar or Jutland or any other decisive sea battle was that the back of the enemy sea power was broken. Unless there is a compelling tactical purpose, a fleet commander will never attack enemy ports or commerce at the expense of his main strategic goal: the destruction of the opposing fleet. The precept holds good for air no less than on the surface of the earth. And it is at the other end of the scale from "bombing alone."

Allied air power did not address itself to its primary business, canceling out the *Luftwaffe*, until late in 1944. The initial years of air action were largely irrelevant as a demonstration of true air strategy since they ignored and violated the basic law stated by Clausewitz.

In his book *Bombing and Strategy*, perhaps the best reasoned of the published attacks on air power, Admiral Sir Gerald Dickens shows lucidly that the job of a navy is to confront and defeat the enemy navy. He points out the folly of eccentric actions which deflect from this principal purpose. Dipping into history for an illustration, he writes:

Whenever we were particularly successful against the French at sea, it was when they gave more thought to the *guerre de course* against our trade than to the preparedness for battle of their main fleet. . . . Our strategy on the other hand was to keep

our main fleet concentrated for battle in the best strategical position for bringing the enemy fleet to action should it sally out.

The British, that is to say, did not avoid battle; they provoked it. But that, by analogy, is the very opposite of the policies of night bombing by the R.A.F. over Germany or high-altitude bombing without fighter escorts by the U.S. Air Forces.

It does not occur to Admiral Dickens to argue that the French blunders were an indictment of sea power as such. Then he proceeds to document what is in essence the same kind of blunders on the part of Allied air power: the eccentric actions in the shape of morale and area attacks instead of strategic combat to defeat the German air potential. But from these he deduces that air power as such has been forever proved futile as an independent force!

In another passage he takes more accurate bearings, pointing out that "the air problem seems in broad outline very similar to the naval one. At any rate the air force must have as its object as complete a mastery of the air as is possible, first in the vital areas and then universally." Those who disposed of the air forces in World War II, however, did not make "complete air mastery" their object.

The irony is that the current campaign to discredit strategic bombing is led by the same people who kept air power from attaining the necessary dimensions and independence of command for victory. Having clipped the eagle's wings, hobbled its feet, and tied it with a leash to the surface, they now proclaim in glee, "See, just as we told you—the bird couldn't fly!"

THE ITALIAN GENERAL DOUHET, pioneer air theorist, had an unclouded view of the need to command the air as a prerequisite for *winning* through the air. But this has been distorted in later books interpreting Douhet. Washington was not following Douhet but a misreading of Douhet when it failed to put sufficient armor and armament on the bomber with which we entered the war, and even more so when it refused stubbornly to develop effective fighter escorts.

The main weakness of the Italian General's statement of his case derived from the technical limitations of his time, as well as the fact



that he was not an engineer. Writing before World War I, in the very first years of modern aeronautics, he can hardly be blamed if he did not clearly foresee the character of future aircraft. His strategic concept was correct. But when he came to implementing it he talked of a hypothetical all-purpose airplane combining combat and bombing functions, adequate firepower, and adequate bombing power.

In practice that did not prove feasible. Designers soon recognized that—unless it could be made weightless—a plane could not be made efficient both as a bomber and as a combat craft. Fuel, armament, ammunition, bombs, radar—all add weight, which is a more critical factor in the air than on the surface. Design therefore reaches a saturation point; we simply run out of space and carrying capacity.

But the belief that an all-purpose plane was feasible seems to have been a factor in the attempt to create a bomber that did not need fighter support. Misapprehensions excusable in the days of Douhet are inexcusable in our own technological generation. It is scarcely fair to explain our aerial backwardness as we entered the war in December, 1941, and the misapplication of available air force thereafter, on the plea that air war was still a profound enigma. The supposition that we had to rely largely on guesswork is an alibi for intellectual laziness.

Had our leaders, including top Air Forces officialdom, taken the trouble to analyze closely the use and misuse of aviation in World War I, they would not have been caught so far out on a limb. Nearly everything in the way of tactics and strategy in the air involved in the Second World War had been tested and demonstrated, on a limited scale of course, in the First.

One of the clearest lessons taught by World War I, and underlined by aerial experience in China and Spain between the wars, was the need for protecting bombers by giving them effective firepower and, more important, providing them with the best possible fighter escorts. "Speeds have increased. Guns are better. . . . But the principle of protection for bombardment aviation remains unchanged." \* Having absorbed that lesson in actual air battle, I devoted myself to designing and building long-range fighter aircraft.

To my dismay, the highest air officialdom in Washington seemed \* "My Thoughts on the War," by the author; *Popular Aviation*, April, 1940.

to have little inkling of the importance of bringing adequate firepower into the skies. They thought only in terms of bombing.

In 1938, I approached the head of the Army Air Forces, General Henry H. Arnold, to plead for support of the long-range high-altitude escort plane I had designed. This was the prototype of what was to emerge later, during the war, in modified form as the P-47 Thunderbolt. In the coming war, I argued, daylight bombing without robust escort would be too costly; the losses would tend to become prohibitive. To drive the point home, I drew on my own and other fliers' experiences in the previous war, as well as the air operations in China and Spain.\*

General Arnold, alas, was not impressed. Never having had personal combat experience, he was inaccessible to reasoning based on the lessons of World War I. Those, he insisted, proved nothing about future conflicts. He was building bombers, he assured me, that would fly so fast and so high that nothing could stop them.

As for my strictures on inadequate armament on the B-17, he explained that its superior flight performance made armament irrelevant—it would not have to accept combat. Such firepower as the plane carried, he indicated, was more for the morale of the crews than in anticipation of real battle. The notion of using bombers and fighters in a combined operation seemed to him grotesque, and he advised me in so many words to “stick to my drafting board” and “leave tactics” to him.

The episode is typical of the long and futile struggle some of us carried on for years to convince Washington of the need for greater range, firepower, and escorts, for greater battle vitality in the air. When I urged additional gasoline capacity for the Seversky Army fighter, at a cost of \$1879 per plane, I was notified by the Air Force in writing that the “potential advantage” of the extra range did not warrant that extra expense!

Even the spirited support of General Frank Andrews, an airman of great stature as a strategic thinker, was of no avail. In 1938 he informed me that he had requested that some of my P-35 fighters be equipped with long-range wing tanks, without results. Three years later, when war in Europe was demonstrating our point, I received a

\* Letter to Air Corps Matériel Division by the author, June 25, 1938.

letter from him that included this pointed reference to our earlier, futile struggle: "*Too bad that we could not have had greater vision in our directing heads of those days.*"

In justice to the late General Arnold, it should be remembered that he worked under great handicaps. The Air Corps he headed was subordinate to the Army; the rules he followed were fixed by others. He had the particular gifts of accommodation that enabled him to function within a setup which had defeated General Mitchell and General Andrews, his predecessors. The events of that time reflect less on General Arnold personally than on the whole system, of which he was the instrument.

My long-range fighter (AP-4), of course, was ultimately put into production as the P-47. Much of the credit should go to General Delos Emmons, who headed up a special board to deal with the appalling military deficiencies of our aircraft. With his fine grasp of strategic and tactical requirements and his overall good judgment, Emmons saw to it that our pilots could go into battle with the advantage of adequate armor, guns, self-sealing tanks, and other combat prerequisites.

However, having recounted the sad tale in my previous book, I need not rehearse it in detail here. With the government refusing even an experimental order, my company went ahead and built the prototype of the Thunderbolt at its own expense. In his book *Global Mission*, General Arnold, referring to me, wrote: "For some reason or other he seemed to think that I, and I alone, was responsible for not buying all the planes he could build." I did not hold him responsible for not buying *all* the planes I could build, but only for not buying the *one* plane which I begged him to buy—the long-range escort fighter that in due time helped win the war.

But human memory is a strange mechanism. In his book, I was amazed to find General Arnold crediting himself retroactively with views on the escort issue the very opposite to those he expressed to me, and acted upon, in the course of many years. Had he believed in the need for escorts, American air power could have been spared some portion of its tragic ordeal. The size of our air forces might not have been much greater; that was fixed by the available funds. But its composition and combat vitality would have been more realistic.

"Naturally," General Arnold wrote, referring to the middle nineteen-thirties, "notions that the bombers might be able to outrun defending fighters temporarily existed. . . . Nevertheless, we became convinced—at least I certainly did—that long-range heavy bombers must have not only increased firepower and mutual support but also a fast maneuverable fighter escort which could go with the bombers to their target."

The facts, however, are that no such fighter escort was forthcoming. We joined the war two years after its outbreak without proper escort aircraft; we bombed in daylight unescorted until we could no longer take the frightful losses; thereafter a modified version of the very escort airplane rejected five years earlier became the backbone of the fighter force. As for the B-17 which was to "fly so high and so fast," it was universally condemned for its insufficient armament. Had the head of our Army Air Corps been so "certainly . . . convinced" of the need for long-range escort craft, then there was even less excuse for his failure to provide them.

The sad truth is that none of the fighter planes with which we entered the war was a match for the German combat planes. None of them had the range to accompany the B-17. But the two planes which had not rated so much as an experimental order but were developed by their respective companies notwithstanding as a speculation—the Thunderbolt (modified version of the AP-4 prototype) and the P-51 Mustang—proved combat-worthy and effective.

General Arnold wrote that the U.S. Air Forces were reconciled to a "loss-rate of twenty-five per cent" a month in unescorted daylight bombing. This rate of attrition seems the more shocking when we recall that it was wholly unnecessary. It was imposed upon us not by technological imperatives but simply by faulty planning, in disregard of a large body of practical experience.

The climax of the tragedy came in late 1943. On August 17th we lost 59 bombers over Schweinfurt and Regensburg. On October 14th the brutal record was topped in a second daylight attack on the Schweinfurt ball-bearing plants. Out of the 228 bombers making the run, 62 were lost and 138 damaged; 539 of our crewmen were killed and 40 wounded.

Instead of acknowledging the bankruptcy of the idea of unescorted

bombing, Washington chose to brazen it out. Despite the terrible losses, General Arnold told a press conference, he was prepared to continue the procedure. The price was steep, he said, but after all "we got the ball-bearing works at Schweinfurt." \* As summed up by *U.S. Air Forces*, the disastrous battle "struck a heart-damaging blow to the entire German war production and machinery maintenance program." †

They were thoroughly mistaken. Immediately after V-E Day, I visited Schweinfurt and interrogated the industrial personnel on the spot. Damage to the ball-bearing industry was relatively mild. "No equipment was ever delayed because bearings were lacking," ‡ the Germans were able to boast with substantial truth. Yet the battle of Schweinfurt was, I believe, one of the most significant air engagements of the war. For it proved glaringly the dreadful fallacy of attacking Germany without adequate combat power and especially escort fighters. The American boys in that battle did not die in vain; their sacrifice saved thousands of other lives by forcing a halt to the suicidal procedure.

General Arnold wrote that bad weather stopped attempts at new Schweinfurts. Actually it was a horrified and indignant public opinion that did this. In the words of the Bombing Survey, "deep penetrations without escorts were suspended." When our bombers returned to Schweinfurt and other targets in 1944, they came properly escorted. The loss-rate was thereupon sharply cut and kept declining as genuine combat whittled down the *Luftwaffe*.

In interrogating Marshal Göring after V-E Day, we asked him: "When did you know that the *Luftwaffe* was losing control of the air?" He replied promptly: "When the American long-range fighters were able to escort the bombers as far as Hanover, and it was not long until they got to Berlin." It is unfortunate that in reporting this interrogation fairly completely in his book General Arnold omitted this significant passage. (Incidentally, General Spaatz did a brilliant job in guiding the examination, in which Generals Patch, Vandenberg, Curtis, Barcus, and Bruce Hopper and I participated.)

\* Associated Press, October 18, 1943.

† Associated Press, October 16, 1943.

‡ United States Strategic Bombing Survey (European War), September 30, 1945, page 29.



THE EXAGGERATED claims made in Washington for the battle of Schweinfurt unfortunately were no exception to the rule. From the start there was a tendency in Air Forces publicity—in Washington, not at operations centers—to color news to make the victories seem bigger and the defeats smaller than life. Today the record of these exaggerations gives critics of strategic air power considerable substance to feed on.

Press and radio, of course, had little alternative but to drum up the information and interpretations pipelined from headquarters. Under war censorship rules they were largely at the mercy of Public Relations officers. Many an editor and commentator realized that the words “restricted, confidential, secret, top secret” served not only to safeguard security but to safeguard leaders against criticism.

In May, 1944, radio commentator H. V. Kaltenborn complained about an impression of undue optimism in the official analyses of air engagements. I was obliged to agree with him. “We are now reaping skepticism where we sowed superlatives,” I wrote, and underscored a fact which present critics would do well to take into their calculations.

“Certainly the blame,” I pointed out, “does not rest with the airmen in the field of action. They have always emphasized the difficulties when laymen and non-combatant officials were putting the stress on achievements. Out of political headquarters in Washington we were receiving glowing tributes to airplanes which the boys who flew them and fought in them knew to be below par.” \*

A case in point was provided by the Air Forces summary of operations in 1943, made public in the spring of 1944.

Taking the two key figures of 11,042 Axis planes destroyed at a cost of 2,885 American planes, it claimed “a victory ratio of almost 4 to 1.” Press and radio swallowed this estimate uncritically. But airmen knew only too well that the picture was not quite so favorable. Many of them, I happen to know, resented the sugarcoating of the pill.

In reporting aerial combat, numbers mean little. The ratio of weights provides a truer gauge. Suppose that in a naval battle four destroyers had been sunk at a cost of “only” one dreadnought. It could

\* McNaught Syndicate, May 29, 1944.

hardly be palmed off as a 4-to-1 victory. The relationship holds good for air battles. The flaw in the Air Forces presentation was simply that American losses were overwhelmingly in two- and four-engined bombers, whereas the German losses were almost entirely in fighters. Not in numbers but in aircraft tonnage and economic investment, it could be readily estimated, our losses were as great as Germany's. Indeed, since the fighting was over German soil, the likelihood is that the Germans lost a total of no more than 2,000 pilots. American personnel losses probably reached 6,000, making the ratio in this respect more probably 3-to-1 against us.

Soon thereafter an official communiqué reported that 36 enemy planes had been shot down at a cost of "only" 9 four-engined bombers and 9 fighters. Transposing the figures into weights, this meant that we brought down about 360,000 pounds of hostile aircraft at a price to ourselves of "only" 700,000 pounds; that we eliminated 18 or 20 of Göring's airmen at a price of 90 or 95 of Uncle Sam's!

As I noted in the first chapter, exaggeration was especially wild in the lush advertising of certain aviation companies, designed to "sell" the performance of airplanes which were patently inferior to the enemy's. Some colleagues objected when I exposed stepped-up claims, in a magazine article. But I believed that loyalty to the airmen flying aeronautical mistakes must take precedence over loyalty to the planners of such planes. Fortunately others were of the same mind. Much credit is due, for instance, to President Truman, then a Senator and chairman of the Senate special war-investigating committee, who brought courage and candor to the unpleasant job of exposing defects in the current military planes.

The story of the P-40 offers a particularly raw episode in the silly attempt to cover up defects with flamboyant publicity. That plane had been hailed by Washington officials as our first line of defense in the skies. But American newspapermen quickly confirmed what aviation people knew in advance: that the P-40's were lamentably inferior to the British fighters. Hundreds of these craft, sent to England, were not uncrated; ultimately they were unloaded on Libya, where they were good enough against obsolete Italian airplanes. American aviators in Britain by-passed their own fighters and flew Spitfires instead. In the Pacific theater, we used them because we had nothing else, but

operational leaders did not conceal the inferiority of P-40's against Japanese fighters.

When I blazoned these facts as widely as I could, in the hope of forcing improvements, the answer on this side was an advertising build-up for the handicapped plane by Curtiss, the builder of the P-40, and General Motors, who provided the Allison engine.\* Among other things they dramatized the great work of General Chennault and his Flying Tigers. Though the achievements were the result of the General's brilliant tactics and the Tigers' teamwork that baffled the Japs, the advertising implied that the explanation was in the terrific performance of the P-40. It ignored the General's known warning to his men: "Never accept battle unless you have a 3-to-1 superiority" to compensate for the defects of the plane.

A significant episode in this connection can now be told. The publishers of *Victory Through Air Power*, in which I detailed the truth about the P-40, received a letter in support of my position from General Chennault in China, dated January 18, 1943.† The "gift of vision and imagination was either denied to or inhibited in most of our leaders who should have been preparing for this present war," he wrote. "It remains to be seen whether the lesson has been learned and whether proper weight will be given to air power now in order to insure early victory and minimum losses. The record to date is not very bright."

Like General Andrews, General Chennault put his finger on the right spot: failures in the planning echelons. While his name and fame were being used to glorify the faulty plane, Chennault himself was thus seconding the efforts to reveal the unvarnished facts.

The alibi for every species of misrepresentation, of course, was the supposed need to boost the morale of our aviation personnel. But the men at the fighting fronts preferred the truth. General Chennault's message was one of hundreds from Air Force men urging that I persevere in the struggle for better equipment and realistic appraisal of existing equipment. No fancy drawings and box scores

\* In fairness to the aircraft industry, it should be stated that in its production and advertising alike it merely followed specifications from "the customer" in Washington. The shortcomings reflected neither on the abilities nor the patriotism of the designers and manufacturers.

† For text of this Chennault letter, see Appendix.

and advertising hoopla could make up for lack of combat vitality, range, speed, and other performance elements in the life-and-death test of actual warfare. Those who had to use weapons could not be and were not fooled; and they realized that the best hope for improvement was in an informed and aroused public opinion.

As a counterweight to the growing criticism of our air equipment, Washington tried to elicit statements of approval from well-known airmen. One of those who considered it his patriotic duty to comply was Eddie Rickenbacker. His prestige as a World War I hero was especially effective in reassuring some civilian critics. Rickenbacker was sent on a global tour of the war theaters and returned with a clean bill of health for everything done by the Air Command in Washington.

At that time the American people were puzzled by the fact that our pilots were flying British Spitfires and not American planes. Rickenbacker's comment on this fact was: "Why should we ship planes to Britain? . . . The British already have more than they can use. You wouldn't ship pineapples to Hawaii, would you?" \* Actually, as all airmen knew, General Spaatz borrowed Spitfires because American fighter planes were unable to stay in the air with the Germans. He did so despite Britain's own shortage, as indicated by that country's purchase of four hundred P-40's, which proved so inferior they were not even uncrated. As soon as we had better "pineapples" we did ship them. It was "pineapples" like the Mustang and the Thunderbolt, sent in thousands to replace the P-40's, that helped win the war.

Rickenbacker was making a sacrifice on the altar of morale. It would have been a more realistic morale-booster, in my view, to make the public aware that mistakes were being acknowledged—and corrected.

The unwarranted claims are now coming home to roost in organized derogation of strategic air power. They now enable opponents of air strategy like Mr. Baldwin to cite "a diet of air 'facts' during the war that have been proved to be erroneous in many major respects . . . wide discrepancies between the overenthusiastic claims made for strategic bombing during the war and the actual results." † But the

\* Los Angeles *Times*, September 11, 1942.

† Hanson W. Baldwin, New York *Times*, July 21, 1949.

advocates of air strategy and the airmen on the fighting fronts have a clear conscience in the matter.

The present commanding echelon of our air forces is drawn from officers who did the fighting, not the publicizing. Yet it is upon them that the exaggerations are now boomeranging. It is not easy for them to admit facts that reflect on their wartime superiors and on five-star generals still on active status. General Vandenberg, for instance, was one of those who did the fighting, not the talking, as commander of the Ninth Air Force. Yet he must contend with attacks on air power deriving from strategic, tactical, and publicity mistakes made by others. Like it or not, such officers must avert their eyes from skeletons left over in the Air Force closets from the war years. Incidentally, General Vandenberg's stature has been growing continually; a brilliant tactician in time of war, he has also shown himself a very able strategic planner since he became Chief of Air Staff.

I have considered it necessary to touch on the seamier sides to indicate the handicaps under which air power operated, the errors both outside and within the Air Force organization. Provided they are frankly faced, their lessons heeded and applied, these errors can be more valuable for the future than the successes. We need understanding, not alibis.

My criticism, of course, is directed against the faulty planning and concepts which put an undue burden on our fighting men and on the people at home. They met the challenge of that burden with amazing valor and resourcefulness. In the end these human qualities more than made up for deficiencies in planning and equipment.

Visiting our fighting fronts, I was filled with admiration for the people who did the fighting—the good-natured and even humorous attitude with which they faced their predicament. I refer not only to the courage of our boys under fire but to their moral courage, in making bold decisions on the spot and shouldering full responsibility for the consequences. It was something nurtured by our free way of life, in which conscience rather than fear is the final measure of a man's duty.

On-the-scene commanders had the courage of their practical convictions in dealing with specific problems. General Doolittle proceeded to use fighter escort in defiance of a contrary official concept in Washington. General LeMay dared to yank his B-29's down from



thirty thousand to seven thousand feet over Japan to make his bombing effective, despite HQ misgivings—a decision that, in the perspective of history, will surely rate with Admiral Nelson's to maintain the battle at Trafalgar. These were decisions under fire that spelled the doom of our enemies. They highlighted an attitude of democratic initiative that pervaded all our forces. Only the democracies could have started with such flimsy concepts and implements and ended up with robust victories.

MOST OF THE MISTAKES compounded by the Combined Chiefs of Staff in the aerial Battle of Germany would have been mitigated and perhaps avoided entirely if the lessons of the Battle of Britain had been correctly read.

That first clear-cut test of pure air-power action remains the most misunderstood engagement in the whole war. It provided almost a laboratory sample of warfare in the air age. But intelligent interpretation of a laboratory test is as important as the procedure itself.

When the Germans failed over England and retired from the fray, both their own and the Allied high commands were convinced of the inefficacy of air power. Their prejudices and preconceptions seemed conveniently confirmed. Nearly all American analysts indulged in some loud crowing, some of it beamed in my direction.

Their reaction had more to do with psychology than with military logic. Our country had been oversold on German aviation strength. Now that "invincible *Luftwaffe*" had been beaten. *Ergo*, air power had failed. . . .

Because of his great prestige, Colonel Lindbergh was especially influential in encouraging a false estimate of the *Luftwaffe*. Having had no combat experience or military background as a guide to strategy or tactics, he was swept off his feet by the numerical superiority of Hitler's air forces. The fact that quality is more telling in the air than quantity escaped his calculations. He was honestly persuaded that in a showdown the *Luftwaffe* would make mince pie out of the R.A.F. Not only laymen but top-shelf air generals without combat background had accepted such reports uncritically. When the Battle of Britain got under way, I have been told, one of these generals

rushed to President Roosevelt with the dire warning that England would not last more than two weeks.

I visited Germany about a year after Lindbergh, but got a totally different impression. In spite of the size of the *Luftwaffe* and its fine organization, I found it pitifully underarmed. In a duel with the R.A.F. Spitfire, I believed, the German planes would be shot down like so many clay pigeons. Lindbergh had failed to note that the German bombers with their single thirty-caliber machine guns were virtually unarmed as compared with the British Hurricanes and Spitfires carrying eight machine guns each.

In the panicky days of the battle over Britain, I was therefore able to reassure people that the R.A.F. would come out on top. I think back with amusement to a phone conversation with a United Press editor who had asked me for a statement on the battle then in progress. I predicted a British victory. In a few minutes he called back. Because I was a good friend of the U.P., he said diplomatically, he did not want to see me out on a limb. In view of the almost unanimous "expert" opinion to the contrary, wouldn't I hedge a bit to protect myself in case I was wrong—as he evidently believed I was? My judgment, I explained, was not based on guesswork but on a thorough analysis of the contending air forces—their combat qualities, organization, quality of command—and I was willing to stand by my conclusions.

"Defensively," I said in that interview, on June 5, 1940, "Britain is greatly superior. Her Spitfire, which I flew last summer, is a superior plane to any which the Germans have in great numbers. Therefore, no invasion of England is possible until that superiority in the air over England is achieved."

The persistence of the mistaken interpretation of the Battle of Britain is something to marvel at. At this late date I find it repeated in crystal-pure form by Dr. Lapp, in *Must We Hide?* In the Battle of Britain, he writes, "air power had met its first rebuff. Appropriately enough, it had succumbed to enemy air action. . . . It had proved to be its own worst enemy."

Because the defensive air forces showed themselves stronger than the attacking forces, air power was "rebuffed"! Because the invaders of the sky were defeated by sky force, air power was "its own worst enemy"! By this reasoning, naval power was discredited at the battle

of Trafalgar and land power was shown up as a flash-in-the-pan at Waterloo. In both instances the defeated forces succumbed to action by their own species.

Even today I still feel called upon to refute the absurd judgment that the claims for air strategy had been "exposed" over Britain. The world needs to be reminded of the obvious: that air power, having retained control of its skies, saved England from the planned German invasion.

The story is told, though perhaps it is apocryphal, that General Spaatz stood on a London rooftop watching a German air raid during the Battle of Britain. Observing the inept performance of the attackers, he lost his temper and roared, "The damn fools are setting air power back twenty years!"

The Battle of Britain, of course, proved nothing about bombing except that it could not be undertaken on a scale for victory without first eliminating the defensive air power. It confirmed the fact of mortal combat, in the air as in any other medium; the fact that the weapons and equipment of air strategy could be as misconceived and as ill applied as the weapons and equipment of land or sea power. "If Hitler has failed to beat Britain into submission from the air, it is simply because he did not possess weapons adequate for the task." \*

Had Hitler been capable of analyzing the Battle of Britain, he would have built an air force geared for the single job of taking control of the skies over the British Isles. He had the means and the prototypes of planes for this assignment. The whole course of the war would have been changed. His error—on which we collected military dividends—was in assuming that the failure of his particular air force spelled the failure of air power itself.

A good many writers and military leaders today recommend the same kind of illogic. Pointing to shortcomings of strategic air power against Germany, they underrate air strategy and seek a return to old-style surface warfare.

The successful British defense against Hitler's aerial blitz proved what should have been apparent in advance: that a well-prepared nation possessing superior aerial defenses may be badly mauled, but

\* "Why Hitler's Planes Failed to Beat England," by the author; *Look*, December 17, 1940.

it cannot be defeated by bombing. This lesson was ignored in the area and morale bombings soon thereafter unloosed against Germany. But it remains valid regardless of the size and character of the bombs, so long as they are carried by piloted aircraft.

Now, as always, the industrial war-making vitals of a belligerent nation are shielded by military force which must be overcome before victory is scored. In the past the industrial heart of a country remained unmolested until its shielding forces—armies, navies, or both—had crumbled. Today the shield is provided by air power. That, no less, must be neutralized or destroyed before surrender is exacted.

The novel and even revolutionary element in aerial warfare is that the war-making vitals of the nation under attack do *not* remain unmolested. Air power can, and normally must, operate against the opposing military force and against its industrial basis simultaneously.

The balance between bombing and combat effort is never fixed, depending on the nature of the opposition. Naturally, if the adversary's means for making war can be annihilated without resistance, so much the better. But that was not the case in Germany. Assuredly it will not be the case should there be a war with Russia. In the next war as in the last the defeat of the opposing air power will rate priority over other objectives.

Both the Battles of Germany and of Britain must be studied and comprehended in preparation for the air battles of the future. To renounce air strategy because the German Air Force was defeated over the British Isles, or because the Allies were ill prepared for an air offensive in the earlier years over Germany, would be irrational. We have even more to learn from failures than from successes.

## AMERICA'S STRATEGIC POSITION

## 1

THOSE WHO SUPPOSE that the mere acquisition of the atom bomb by Soviet Russia marks a new "strategic phase" for the United States are way off the beam. A nation possessing atom bombs may be beaten by a foe who has superior means of delivering less powerful explosives. Its security position is determined by the vehicle, not the cargo. The problem in every instance is to take over control of the medium—the air—so that the destructive agents, whether atomic or non-atomic or both, may be applied in the right place at the right time in the right amounts to paralyze the enemy's war-making establishment.

With that principle in mind, the position of America in this aerial epoch can be realistically divided into three distinct phases:

*Phase One:* When air power cannot score a decision unless it is provided with overseas bases. This demands also huge armies and navies. The national effort is thus split three ways, so that none of the forces attains its maximum potential.

*Phase Two:* When air power has sufficient range to score a decision from its continental source of power, without need for outlying bases. National effort in that case is put overwhelmingly into such air power, so that it achieves its maximum potential. The Army and the Navy are reduced to a minimum as auxiliary and follow-up forces.

*Phase Three:* When atomic and other explosives can be delivered to the enemy targets by robot interhemispheric supersonic guided missiles. Almost the entire national effort then goes into these unpiloted missiles, with Army, Navy, and Air Force reduced to minor auxiliaries.

Let us deal with the third phase first. That will be the so-called push-button era which some of our leaders sold to a panicky public



as "just around the corner." The all-mechanized war is always good for an extravagant preview in Technicolor. The push-button era to come provides a forecaster's field day for pseudo-scientists. Their formula is simple enough: take the V-1 and V-2 robots, provide them with atomic and other warheads, endow them with a range of four or five thousand miles, enable them to seek out their targets with deadly precision—and presto! the fully automatic war is a fact. The formula, however, slurs over very tall technical barriers still to be leveled off.

I do not doubt that push-button warfare will be possible someday. Let us hope by that time war will have been relegated to the savage past. The release of atomic energy as a new form of propulsion may bring that day too close for comfort. Obviously we dare not lag behind in research and experimental work in this field; nothing I say here should be construed as an argument against American leadership in guided missiles. But the corner to be turned is still a long way off. For a great many years to come robot weapons will be militarily practical only for a very limited range.

When the push-button age dawns, nations will in effect become true fortresses, shooting it out with long-range artillery in the form of supersonic guided projectiles. Scientists, engineers, and switch-board specialists will do the "fighting" from safe and comfortable underground control rooms. Mobile conflict will give way to a static bombardment duel of global dimensions; the opposing forces will be stationary, pinned to their positions, until one or the other "fortress" crumbles.

Since most if not all robot weapons will be electronically controlled and guided, the real struggle, also at global range, will be *for the electronic right of way*. The sources of electronic power will rate as the number one targets. The side which captures electronic mastery will smash the rival "fortress" to the point of surrender.

Some enthusiasts believe that we need not wait for the development of the ultimate in guided weapons. They suggest that we place reliance immediately on the long-range subsonic variety already technically available: the so-called drones, ordinary present-day robot aircraft guided by electronic means, equipped with television sights and capable of flying perhaps six hundred miles an hour.

But these drones can never compete with aviation guided by hu-

man intelligence. They will be shot down easily by any second-rate defensive air force and by anti-aircraft ground defenses.

Hitler's V-1 attacks on London enjoyed the advantage of surprise. There was momentary confusion. Before long, however, ninety per cent of the missiles were being intercepted. In the future that percentage will certainly be higher, and in time will come close to the hundred-per-cent mark. In the contest between automatons and brains, the brains must prevail.

The surprise element will no longer be present. The distances involved will be reckoned not in scores but in hundreds and thousands of miles. Even at speeds of six hundred miles an hour the pilotless aircraft will be subject to enemy interception for hours before they get to the appointed target. While a few of the missiles may reach their destinations, the ratio of waste will be prohibitive.

At most the drone type, when applied at extreme ranges, constitutes a nuisance weapon. No strategy based on it and aiming at a decision can afford the nearly total rate of attrition. The belligerent who stakes the outcome on such an enterprise will be committed to futile exhaustion of his resources. Anyone who recommends this procedure is really counseling defeat through bankruptcy.

The guided missile will become a profitable strategic weapon only when it can carry substantial destruction across oceans at speeds of thousands of miles an hour; only when control is so perfect that it can be placed on targets thousands of miles away with extreme accuracy. While within the realm of ultimate possibilities, these conditions will remain theoretical for a great many years.

Military historians tell us that invention of the torpedo—an under-seas self-propelled missile—aroused excited speculation in its day. There were those who saw it as the nemesis of navies, making the seas untenable for fighting ships. Actually, the torpedo took its place as another weapon of sea power. For the foreseeable future the guided missile similarly will take its place primarily as another weapon of air power, both in offensive and defensive roles.

Paradoxically, this weapon born of war is likely to find its first long-range application in peacetime commerce. I believe that before long mail, banking papers, and other cargo will be carried between nations and across oceans by drones, jet or ramjets, and later rocket-propelled

robots. Just as containers now move through pneumatic tubes, pilotless airplanes will fly swiftly and accurately along radio beams between points farther and farther apart. Remote control by radio will be perfectly feasible when there is no enemy interference but, instead, co-operation at both termini. The pilotless plane will be guided into its "stall" at its destination with perfect precision by radio beam.

Today, if a transoceanic plane is crippled in flight, its cargo sinks with the aircraft. But the robot planes, having no crews, will need no supercharged cabins. It will be possible to make their cargo compartment indestructible, fire-resistant, floating, and equipped with visual and radio devices to facilitate recovery by searching ships and planes in case of failure in flight or forced landing.

In short, while commercial exploitation over long distance may be in sight, military exploitation has no realistic relation to the predicament of the present world. Our concern is with the other two strategic phases.

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PHASE ONE—the strategy tied to overseas bases—offers nothing novel. That was how World War II was fought. It is ruled out by conditions we have already examined in some detail: the impossibility of defending bases in the enemy's "back yard," and the impossibility of maintaining local air control.

But we are today preparing for another war of the same character. The size of Army and Navy appropriations leaves little room for doubt in this respect. True, the Air Force has recently been allowed more freedom in developing its aviation. It quickly seized the chance to order more bombers of intercontinental range, which is all to the good.

But despite some lip service to pure aerial strategy, the overall preparations are still of the Phase One order. They still assume chains of outlying bases, conquest of local air supremacy over limited areas of operation, land-sea-air teams to overcome obstacles of geography. And the last act of the drama of war is still envisioned as a showdown between gigantic armies on old-style battlefields.

After General Hoyt Vandenberg took over command in July, 1948, the Air Force succeeded at least in denting the interservice compro-

mise. It diverted a sizable slice of its funds to the intercontinental B-36 and, despite frantic protests and attempted personal smears, made its decision stick. General Vandenberg, not having been directly involved in the Key West and Newport compromises, presumably could break through the restraints which had morally bound his predecessors.

But this should not foster illusions. Concessions to the air-power thesis are being made grudgingly, for the most part as a sop for public opinion. The Phase One concepts have not been jettisoned; they remain substantially our official strategy. Secretary Johnson, evidently summarizing the uneasy compromise reached by the services, was explicit enough on December 7, 1949, in addressing the Congress of American Industry. The first American counterattack against an aggressor, he said, would be made by the Air Force, while the Navy and Army carried out supporting assignments.

"We must be prepared," he explained, "to hold the line for a time, and most likely a long time, until our own backfield, the Army, is fully mobilized, equipped, trained, and organized, ready to carry the ball into enemy territory. . . .

"When the time comes that we are ready to change to the offensive and take up the ball ourselves, then the limelight will fall first on the Navy. It will be up to the United States Navy to carry our Army and our Marines, too, safely across dangerous waters, perhaps submarine-infested, defeat any hostile sea or air forces that might interfere with this vital mission, and land our doughboys safely on a hostile shore.

"And once the expedition is safe overseas, it will be the ground forces of the Army that will carry the ball while the Navy and the Air Force will assume the supporting and blocking jobs."

There we have the epitome of orthodoxy and Maginot Line thinking! Colossal ground forces carried and supplied by colossal naval force for a Napoleonic mile-by-mile struggle! Intercontinental strategy is still treated as an extra, a preliminary retaliatory and "softening" technique, parallel with the old reliable triphibious plans.

It is too late in the day for diehards to keep the Air Force from exploiting the full range of modern aviation. They are now willing to play along with the "extremists"—provided the Army and Navy and Naval Aviation are not impaired. Side by side with the major and

fundamental program of open sea lanes and a ring of outer bases we thus have a minor program that dispenses with those things.

The two programs of course are mutually exclusive. Logically they cannot both be valid. Each is penalized by the existence of the other in that it siphons off resources and manpower from the limited national reservoir. The dual arrangement merely proclaims a state of confusion.

The dominant planners, clearly regarding intercontinental strategy as an eccentric sideline, have been exploring the notion of a swift, single atomic attack through the air the instant that war breaks out. Let air power have its fling, they seem to suggest, and if it fails, we can still fall back on orthodox surface procedures.

That notion obviously has nothing in common with genuine air strategy, geared for sustained struggle and looking to a clear-cut decision. But for a time the Air Force unwisely accepted and encouraged this one-blow concept. It helped dramatize the idea by carrying out stunt flights around the globe with the aid of refueling devices, leading the public to believe that even with short-range aircraft we might be able to mount a long-range strategy. It countenanced a rash of magazine articles describing the one-blow vision as if it were the trick answer to our strategic prayers.

Although serious strategic writers and planners have been climbing off that brittle limb, it lingers in the popular imagination, if only because it evoked the chimera of a short cut to victory. Typical of the one-blow propaganda was an article in the *Saturday Evening Post* by Stewart and Joseph Alsop, entitled "If War Comes." \* I select it from the assorted lot because the editors assured the public that it reflected views "at the highest policy level" in military Washington.

The authors begin by outlining the familiar strategy resting on a network of overseas bases and a contest with the Soviet land might. Then they unveil what they call a "new" and "novel" wrinkle. This is "the additional provision of a *small, specialized offensive force* . . . composed primarily of long-range bombers. But the bomber will carry the absolute weapons, and will have the mission of destroying the enemy's vitals in immediate retaliation for the first aggressive act." This the writers, and presumably the military men who gave

\* September 11, 1948.



them the exciting "dope," regard frankly as a "gamble on the special offensive force."

At a signal, bombers will take off from prepared overseas bases. Others will strike from Arctic points by means of in-flight refueling. And all of them will converge on the enemy's decisive targets. The "gamble," of course, is whether such a concentrated opening blow will suffice to cripple the enemy. The very use of the term is an admission that the project is far from foolproof. Yet the article concedes that *"the whole new strategic concept stands or falls by the gamble."* I submit that a strategy so tenuously founded is little more than wishful thinking. Certainly it is hard to believe that serious strategic planners are resting all their hopes on a gamble.

The whole fabulous scheme amounts to a lefthanded indictment of current strategy. If "destroying the enemy's vitals" is finally acknowledged as the key to victory, why should we depend on a single sneak blow when sustained offensive from our own mainland by superior air power is admittedly possible?

There is a semblance of justification for the one-blow theory in a war that might break out tomorrow—provided we begin now to create the strategy that steers clear of the gamble. Tied to a backward surface strategy, the "specialized offensive force" is a dangerous evasion of reality that promotes a false dream of easy victory.

The adjectives "new" and "novel" as applied to the project are a gross exaggeration. Japan happens to have got there first. Its specialized offensive force was exhibited at Pearl Harbor on December 7, 1941. What the article cited and others of the same sort describe is no more than a *Pearl Harbor in reverse*.

Japan, too, gambled on a single, crippling blow—and it lost, despite the magnitude of the damage it inflicted upon us. Such miracle blows have always tempted nations. But no matter how great the damage inflicted, they have always fallen short of victory in modern times. Modern wars have never been won except by long and sustained struggle at high cost. To stake our survival on the off-chance that the next war will be the exception would be foolhardy.

The overwhelming likelihood is that it will be impossible to destroy the war-making vitals of a country as huge and strong as Stalin's in one or a few surprise blows, even with atom bombs. Many of the mis-

sions will be abortive; many of the bombs will miss their targets. We cannot hope to know the extent and character of the defensive obstacles without exploration through combat.

In the past, an abortive mission meant the loss of a few hundred thousand dollars in planes and explosives. In the future it may cost billions in wasted atom bombs, planes, and equipment. Consequently, we must plan to reduce the gambling ingredients to a minimum. I cannot warn too earnestly against any Pearl Harbor in reverse. "Shooting the works" is a temptation to which we are dangerously exposed because we have been so brutally oversold on the strategic magic of the atomic weapon.

Before we undertake atomic bombing looking to a decision, the least we require is an Air Force-in-being which can mount a deliberate and continuous offensive for the aerial right of way—and *which cannot be stranded by reverses on the surface of the earth.*

The danger inherent in any premature offensive is that we may deliver a stunning blow—and have nothing left with which to exploit the results. The "special offensive force" may thus prove to be the biggest gift we can present to an enemy steeled to take punishment. It will tend to exhaust our most effective forces at once, with only an old-fashioned surface struggle very much to Moscow's taste remaining in our arsenal of national security.

Artificial props to short-range air strategy, like refueling in flight, or one-way *kamikaze* missions, scattering our bomber force all over the globe in search of safe landings in neutral countries, are devices of desperation. They seem utterly illogical in a period when legitimate means for intercontinental offensive are ours for the asking.

It is highly questionable that there will be neutral countries in the old sense in any future war. How long would the Kremlin or the U.S.A. tolerate the neutrality of a neighboring nation which provided landing strips for enemy air power?

As for refueling to stretch range, it seems to me a stunt rather than a basis for strategy. I obtained the first basic patent for an air refueling device in 1921, at General Billy Mitchell's suggestion. I can hardly be accused, therefore, of prejudice against the procedure. But while it made sense a quarter of a century ago, when any method for expanding range was of value, it doesn't today, when the necessary

range can be built into the plane itself. Amazingly, it was ignored by military planners at that time, and is revived precisely when it has lost its significance.

To enable our B-29's to strike deep into the Urals, for example, the refueling stations would necessarily be located in the Arctic area. That brings them within easy reach of Soviet B-29's based, let us say, on Murmansk. To protect them for sustained action would require defensive air power capable of warding off major enemy concentrations of air force. And that brings us back to the fallacy of local control of a limited segment of sky. The foe needs only to wipe out the highly inflammable gasoline dumps and the strategic air force dependent upon them will be neutralized without combat.

An alternative proposal is to use huge aerial tankers. Presumably they would meet the B-29's and B-50's at some stage in their round trip and "fill 'em up." To serve their purpose, however, the tankers would have to be endowed with performance higher than that of the bombers. At one time, indeed, the B-36 was seriously considered for the job.

But why, in the name of common sense, use superior planes to make inferior aircraft operative? The idea is as topsy-turvy as if, in the past, we had used battleships to refuel destroyers and cruisers to do the fighting. The unwieldy and roundabout procedure would tie up national wealth and effort in fleets of long-range auxiliary planes to service short-range combat planes—when the same potential could simply be put into equipment for direct combat.

The entire refueling plan is a species of "face lifting" for short-range strategic air power. One can understand why airmen, denied true long-range aviation, would be tempted to resort to such expedients. There is no objection to face lifting, provided we do not make a virtue of temporary necessity; provided we proceed to build the aircraft that will end the need for makeshifts.

Refueling devices and techniques must be retained and improved, but only for emergencies and missions of opportunity. We should be prepared to refuel planes that have sprung leaks or sustained other battle damage. The large battleplanes should be geared to come to the rescue of smaller planes running out of fuel. Refueling, in a word, should be accepted as a standard procedure of global air force. But to

predicate major strategic action on this procedure, at this stage of aeronautical science, would be a strange anachronism.

Such an outlived improvisation, and the one-blow illusions to which it is tied, simply have no place in a modern concept of true air power. The best index to strategic common sense is: how much of our aviation investment is being channeled into intercontinental equipment?

After the Washington hearings on the issue, confidence in the B-36 was restored. Yet Air Department statements stressed that "only four per cent" of the aircraft program was assigned to the B-36 type. Apparently this was intended to reassure the country that "moderate" rather than "extreme" counsels ruled in planning. But to those who visualize clearly the intercontinental strategy of tomorrow the figure is not reassuring but profoundly alarming.

It meant that the B-36 is still being regarded merely as a "specialized force," supplementing the fundamental short-range strategy. It meant that our aviation potential is being squandered by diversification for all kinds of wars, rather than concentration on the kind of war we would have to fight. It meant not only that strategic planning is still lost in the jungles of World War II assumptions but that the Air Force, no doubt under political pressure, is tamely stringing along.

We shall never get out of those jungles until we make up our minds where we're going. At that point, I believe, not four but forty per cent will be earmarked for the equipment of intercontinental strategy. The very announcement that thousands of aircraft of the B-36 type, instead of a futile handful, are being built would terrify would-be aggressors. It would confirm clearly America's intention to take command of the air ocean. Yet the Air Force, as that four-per-cent figure makes clear, is being compelled by mistaken overall plans and compromises to diversify equipment and waste effort which ought to be focused on a single, unambiguous strategy for victory.

WHETHER in its pristine triphibious version or in the amended "special offensive force" variant, Phase One warfare rests on intermediary

bases. With such bases indefensible, the whole strategy becomes unreal.

Moreover—and this is the crux of the matter—it is *a strategy that involves insupportable drains on our national wealth and intolerable strains on our free way of life*. Not even wealthy America can long endure the economic costs; not even free America can long sustain the weight of such costs without paying a terrible price in freedom.

Should we choose once more to conduct war simultaneously in all three elements—land, sea, and air—we shall be accepting battle against the tremendous land forces of the Soviet Union, a potential estimated between three hundred and five hundred divisions and probably reinforced from the gigantic Chinese reservoir of manpower. This means war on the Kremlin's terms, with a terrifying risk of defeat.

In addition, we would be challenging the Kremlin's *tactical* aviation, a type in which quantity rather than quality tells the story.

Let me clarify at this point the popular division of air power into "strategic" and "tactical." The telltale difference is not in size, though the strategic aircraft are normally bigger, but in the functions for which they are planned and equipped. Tactical aircraft are designed to operate with and support surface forces on land and sea, aiding them to achieve their surface objectives. They are auxiliary to the surface strength—in effect, a more efficient kind of artillery to clear a path for surface advances and to co-operate in winning surface battles to attain the objectives of surface strategy.

Strategic aviation, by contrast, is designed for the elimination of the opposing air force and the destruction of the industrial vitals of the enemy. Its role is to conquer control of the air and to strangle the military effort in the enemy homeland; if successful it makes surface conflict superfluous.

The problem of tactical aviation is simple compared to that of strategic aviation. Though it calls for great skill, resourcefulness, and stamina on the part of the individual pilot, he deals with visual targets: the enemy troops, armor, and communications. His plane is essentially a piece of artillery with wings. His requisite technical training is well within the scope of the average Russians.

Nor does the plane itself call for extraordinary performance. Being part of a surface battle, quantity is more important than quality.



While an industrially more primitive foe cannot compete with us on the highest strategic air levels, he can readily do so on the tactical level.

From official and unofficial sources I know that German factories in the Soviet-occupied zone have not only continued but have stepped up production of tactical aircraft since 1945. Jet fighters and bombers are being ground out at a faster rate than under Hitler. In several factories which I visited immediately after V-E Day, thousands of parts were ready for assembly. One of them was at Kahla, where ME-262 jet fighters were being built and which we foolishly surrendered to the Russians intact.

At the same time the Soviets are reported to be mass-producing, with the aid of German technicians, first-class tactical jet aircraft in their own country. In view of the size of their army the stockpiling of supporting aviation on a scale to match is only logical.

Contrary to the popular assumption, the manufacture of jet fighters is a lot easier than the manufacture of the propellered types. The jet engine is technologically less complicated than the reciprocal engine. Its design and production are greatly simplified when it is intended for "short-life" tactical operations. In addition, jet-propelled craft are easier to maintain, since they eliminate propeller, ignition, carburetion, and other such problems. They do not call for elaborate repair depots and can readily be maintained in the open field.

At the tactical end, therefore, Soviet superiority must be taken for granted. We know how the Russians can use masses of men and machines: how they sent infantry and cavalry against German armor and literally smothered enemy tanks with the corpses of men and horses. They must be expected to do no less in the employment of tactical airplanes. They will use them as expendables, like so many shells. Quantity being in itself a quality, we are thus inherently as much at a disadvantage against Soviet tactical aviation as against Soviet ground strength. Indeed, the two things are part of a single massive challenge.

Our atom-bomb stockpile does not in the slightest compensate for this inferiority. After witnessing the action of the atom bomb at Bikini, General McAuliffe, the hero of the Bulge who served as Deputy Commander of the Joint Task Force at Bikini, termed the bomb "a stra-

tegic rather than a tactical weapon." The tests, he pointed out, showed that soldiers in dugouts or tanks can weather the blast and heat of near-by atomic explosions and go on fighting. So the use of this explosive against ground troops will be a highly unprofitable undertaking.

Yet the Phase One triphibious strategy would commit us to tangling with the Red Army, its satellites, and vast Soviet tactical air force from the outset. We would be called upon once more to produce at the same time the world's largest Army, Navy, and Air Force, while dividing our aeronautical effort three ways, among strategic, tactical, and naval air forces, all in maximum numbers.

When military planners today talk of "balanced forces" they mean in essence the equal division of every military dollar three ways—for land, sea, and air. And with reference to Phase One strategy they are in general correct. An outsize Air Force without surface strength to match makes no sense as long as it is short-range air power requiring an empire of bases all over the planet.

When Congress was studying the request for fifteen additional air groups, in 1948, Secretary of Defense Forrestal declared that this would require an increase of eighteen billion dollars for the Army and Navy "to support the completely phased military establishment" implicit in a 70-group Air Force. He was entirely logical, within the framework of a Phase One strategy concept. To make every such additional air group operative in combat, "the creation of a balanced establishment of land, sea, air, and merchant marine elements," in the late Secretary's words, is indispensable.

Congress and the American people must understand that they are not providing air power merely *by expanding its size without changing its character*. If and when war started the Army and the Navy would have to tell the country the shocking truth:

"Those seventy groups (or whatever their number by then) are useless. Before we can engage the enemy we must have gigantic armies, navies, merchant marine. The massive air power you have provided, alas, hasn't the reach to fight from our own continent. We must first have or conquer, and then be prepared to defend, at least the rim of the enemy continent. B-29's and B-50's are of no value whatsoever until the Army and Navy provide them with distant bases for operation."

The American people *may thus be led into a trap*. They are under the impression that in paying for a larger air force they are saving on surface forces, but this air power may be a frozen asset. The American people may be stunned by demands for an army of twenty million men, for naval forces to match, for a hundred-per-cent labor draft. All of this and more would be needed to carry the short-range aviation within striking reach of its ultimate targets and to stalemate the Red Army.

The cost of the added fifteen air groups for which the Defense Secretary posted an eighteen-billion-dollar notice was estimated by Air Secretary Symington at 1.8 billions. If Mr. Forrestal's figure was even approximately correct, we have a ten-to-one ratio: ten dollars in surface elements for every dollar put into the skies. Such is the cost of overcoming the factor of geographical distance when air power lacks the capacity for direct interhemispheric operation.

We scarcely need a calculating machine to realize that we are dealing with a strategy which, if it is to have the dimensions for victory over the world's greatest land power, would bankrupt a nation ten times as rich as the United States. And there is more to it than dollars. Every dollar has to be translated into materials, labor, productive capacity. This under conditions where the three-decker strategy is drawing off millions of the physically ablest men for the armed services.

To grasp the exorbitance of triphibious strategy, it may be helpful to recall the Pacific campaign. Costs, which seemed of little moment then, will certainly loom frighteningly in a duel of attrition such as may be expected in a future war. Consider a single episode in that campaign: the taking of the Marshall Islands.

In the attack on the islands we brought to bear about two million displacement tons of shipping of all types. Assuming a modest average of \$2,500 per ton, it means that we concentrated five billion dollars' worth of naval materials and manpower. To this we may add another billion for the equipment for the Army and Navy Air Forces which helped soften the Marshalls for the kill. The whole effort therefore represented *the application of force to the tune of six billion dollars*.

What does such an investment look like when transposed into air-

power terms? What if an equivalent effort had been put into bombers with the range to attack the Japanese homeland directly from Alaska? At the construction costs of that period, we could have had about six thousand aircraft of the requisite range for sustained mass assaults, compared with the later raids by eight hundred B-29s from the Marianas. This force would probably have been formidable enough to knock the enemy out of the war—and this for what it cost just to conquer the Marshalls—just one steppingstone to Japan!

The Pacific strategy in World War II can be summed up thus: *Roughly one hundred and fifty billion dollars of American labor and materials channeled into naval force and another fifty billions into land force—for the sole purpose of bringing about twenty billion dollars' worth of air striking power to the enemy targets!* And that is the kind of expenditures we are letting ourselves in for by adhering to the strategy of the last war through mental and psychological inertia.

To implement a repeat performance of Phase One strategy against a nation as vast and as populous as the Soviet Union, every American, from infants to octogenarians, would have to be mobilized even in peacetime as the program is unfolded. But to support such a swollen undertaking we would have to impose the kind of sacrifices and disciplines, the kind of reduced living standards and increased working norms, which only a totalitarian government can enforce on enslaved subjects. Either we would be obliged to quit halfway, wrecking the whole fantastic military plan, or we would of necessity become a regimented nation. Plans to use foreign manpower do not brighten this melancholy prospect; we would still have to equip and supply the largest army on earth across thousands of miles of water.

It is my contention that Phase One strategy has been outdated by the progress of science and technology; that it is economically insupportable and hence politically dangerous; that it must be deliberately abandoned in favor of long-range aerial strategy.

To patch and bolster the Phase One plan by adding to it a limited and secondary aerial force for intercontinental action—as insurance “just in case,” or to keep airmen happy—simply makes matters worse. It adds that much to the economic burden and accomplishes nothing: a strategy lacking the wallop for victory is no better than no strategy at all.

## CONTRASTS IN WAR POTENTIALS



148,000 SQ. MILES

JAPAN



7,500 SQ. MILES

U.S.A.



U.S.S.R.



7,458,000 SQ. MILES

NORTH AMERICA



7,000 SQ. MILES

EURASIA

(EACH FIGURE REPRESENTS 50,000,000 PEOPLE)

In the last war we fought Japan, a country about one-twentieth our size, yet it took four years before we could approach Japan proper. In any next war, our potential enemy covers an area nearly three times as large as ours, with a population about 50 per cent greater. Should Russia occupy the entire Eurasian continent, its area will be five times as large, with a population nearly 700 per cent greater. Clearly the profligate triphibious strategy employed against Japan would be beyond our capacity against Russia. Obviously, our strategic potentials must be reappraised.



The Air Power Commission set up by the President in 1947, under the able chairmanship of Thomas K. Finletter, did a bold and constructive piece of work. But in seeking to enhance the role of air power they remained within the framework of existing military concept and therefore ended with a compromise. But a compromise in relation to basic military strategy always leads to confusion.

Instead of that small specialized offensive air force "just in case," the Finletter report talked of an air offensive "either directly or by way of intermediary bases." Such a lumping together of attack from our own mainland and attack from distant bases betrays a shocking strategic innocence in our top echelons. Those two varieties of war-making represent totally different strategic species. In one, the air power is a third of an integrated team. In the other it is *the* strategic force, with surface forces in auxiliary roles. The two procedures cannot both be implemented at the same time on a scale assuring victory. To combine them casually in one phase, as if they were complementary rather than contradictory methods, is military gibberish.

The implication of the phrase is that aviation of the Phase One type will evolve gradually into interhemispheric aviation, in the way that a boy grows into a man. The idea is mistaken. To the extent that it delays forging Phase Two weapons, it is dangerous.

Intercontinental warfare is not simply an extension or enlargement of land-sea-air warfare. It is a breakaway from, a repudiation of, the earlier strategy. It calls for wholly different weapons, methods, leadership, industrial setup, training. Such changes involve a major reorganization of our whole national life. The whole industrial mobilization plan, perhaps the product of many years of planning, has to be completely recast—and that takes more years.

When a town in the era of illuminating gas decided to light its streets with electricity, the switch-over was not merely a matter of acquiring electric bulbs. It involved the wiring of the whole town, the building of a powerhouse, the replacement of lampposts, etc. A switch-over from short- to long-range strategy, similarly, is not accomplished merely by providing the longest-range battleplanes.

It is not a casual enterprise to be "thrown in" as a bonus on the old-style effort. It will be a revolutionary change, which can follow only

from a bold intellectual decision. The fate of mankind, I believe, may hinge on how soon and how clearheadedly we make that decision.

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WE CAN and we must free ourselves from the transitory team and dependence on distant bases. For a fraction of the cost of conquering, defending, and supplying a base for short-range aviation we can buy long-range aviation that nullifies the need for that base. The substantial easement of the economic drain will enable us to remain a free and unregimented people while shaping the instrument of victory we are so remarkably well suited to exploit most effectively.

We can and we must cut air power loose from the arbitrary and outlived reliance on huge surface strength. We must seize the strategic initiative—by by-passing the potential enemy's surface might, by lifting the struggle, if a struggle there should be, into the air on our terms.

Were a conflict to break out before this invincible American strategy is made ready, we would necessarily fight with what we have. In that case, however, it would amount to a strategic retreat. The best we can expect is to contain the adversary, fighting for the necessary time to build the indispensable long-range air force-in-being which alone can bring us victory. The air force for Phase Two, direct inter-hemispheric aerial warfare.

I may be challenged on the precise nature of the next conflict. But of one thing I feel absolutely sure: if and when a third World War comes, it will be as different from World War II as that, in its turn, was from World War I. I make this statement without reservations, relying on historical precedent. Though most major wars have been planned to follow the general pattern of their predecessors, not one of them in modern times has done so. The pace of technological progress is too rapid.

However myopic or timid the various high commands may be at the start of a contest, they are driven by the law of necessity, as the struggle unfolds, to resort to the most highly developed weapons and methods.

If we do not change our strategic concepts, any new war, at the

start, is likely to muddle through a most destructive old-style conflict. Terrific atom blows will be struck on both sides, but these will not bring a decision. They will harden both sides to a finish fight at any cost. Swift battles will be fought for outer bases.

Then we shall be expelled from Eurasia and its environs—just as the Allies were expelled from Europe and the South Pacific in the previous war, and for the same reason: outmoded strategy. The life squandered and the areas scorched and the wealth wasted in the process will be parts of the price paid for failure to prepare for the right kind of war-making in advance.

At that point the globe will have been sundered into two separate and isolated halves. Then, if we have survived the ordeal, preparations for the true interhemispheric conflict will begin, years too late, under the duress of events—after millions of men have been needlessly lost. Meanwhile the enemy will be consolidating his conquests and exploiting the newly acquired resources and productive capacity for the looming intercontinental struggle. On both sides the building of proper long-range equipment will be pushed at a furious rate.

Being economically self-contained, the two hemispheres cannot blockade one another into submission. Neither can they come to grips on land or on water. One or the other can impose its will only by direct application of force through the medium of the skies.

No matter how the war is begun, it will thus evolve into a Phase Two contest, with strategic aviation battling for the right of way in the skies. Surface forces will become bystanders; in a sense the world will witness a Battle of Britain of global dimensions.

Intercontinental warfare will come not because it is "easier." It will not come because it is "cheaper," although it does happen to be well within our means, whereas triphibious warfare is not. It will come because there will be no other way to resolve the conflict; because it is dictated by the geographical positions of the nations involved and the availability of weapons to deal with that geography.

A stalemate, while the implements for that aerial showdown are in the making on both sides, is then most likely to ensue. It might be broken by internal upheavals—a Communist seizure of power in the entire West or an anti-Soviet revolt in the East. The war being acutely ideological, the operation of profound social forces could smash all

purely military patterns and prognoses. But short of that, the outcome will await the emergence of the one force that can exact surrender—clearly superior intercontinental air power.

In that fateful interval of deadlock, America would necessarily become more militarized and regimented. The advantages flowing from our freedoms would be rapidly eroded. In the face of a deepening menace to sheer survival, we should ourselves tend to come under the spell of "infallible" leaders who might well lead us into a dead-end street.

Our technological advantage, being the product of personal liberties and a free economic system, would wear thinner and thinner as these democratic values are emasculated. Under those conditions we assuredly would have no guarantee that we could maintain our present head start, our decisive margin of superiority, in the inter-hemispheric warfare for which the deadlocked antagonists would be frantically preparing.

Meanwhile, of course, each side would subject the other to atomic and non-atomic raids, spreading death and suffering. All mankind would live under the pall of impending extermination, so that the very memory of humane sentiment and decency will begin to fade out. Mutual hatred, compounded by despair, would make the contending groups equally determined to expunge one another. Human civilization may then, indeed, perish from the earth.

Such, as I see it, are the likely consequences if we fall into the historical error of unthinkingly fighting any next war with the methods of the last. They can be avoided only if we are great enough as a nation to break with the earthbound past—and begin now to fashion the one force that can give us victory without a futile prelude of terrible blood-letting in a hopeless surface struggle. We need the intellectual valor to overcome military inertia: by a straightforward, clear-headed decision to adopt *now* a strategy expressing the over-all superiority of our technological civilization and our democratic way of life.

## THE WAR OF THE HEMISPHERES

## 1

WE HAVE NOW REACHED the crux of the argument: the war through the skies between the Eurasian and American continents. As already explained, this is not "the best" of several available strategies but the only strategy of victory open to us.

In discussing, in this and the following chapter, the nature of a coming war, I am not assuming that it is inevitable. My contention, on the contrary, is that an obviously invincible American air force can deter an aggressor and insure peace. One does not have to be a "war-monger" to be a realist. There is a clear danger of war—wherefore I urge preparedness of the right kind. That war, if it comes, will be between this country and the Soviet Union—wherefore it must resolve into a contest between two continents. That is the kind of war we must comprehend.

Assuming that both sides are prepared to the utmost, within the limits of their respective geopolitical positions, America's advantages will be distinct and decisive. The clear American superiority in science, industry, mechanical aptitudes, technological versatility can be outweighed on land by Soviet preponderance in numbers and mass. But in the air we can maintain a quantitative superiority along with the telltale margin of qualitative supremacy.

The intercontinental contest I envision, pitched on the uppermost scientific levels, would in the final analysis express the relative stages of the technological civilizations of the contenders. Not only has Russia been historically retarded in this respect, but its current political system cramps its creative energies. A servile ideology, with fear as its central motive, is handicapped as against an ideology of freedom that gives the right of way to individual initiative.



Totalitarian "discipline" does have its value in maintaining production. Nor do I underrate the abilities of individual Russian scientists and technicians. The Kremlin, besides, has captured and harnessed some first-rate German brains. The Soviet showing may be a lot more impressive than is generally expected. The development of a Russian atom bomb, it should not be forgotten, came several years sooner than estimated by people to whom Russia is more enigma than nation. In the course of a war, Moscow may well pull a few surprises in the way of weapons and tactics to discommode us.

Nevertheless, the final score will be written not by a select group but by the respective peoples as a whole—by their total civilizations expressed in aggregate skills and tools properly used.

Soviet Russia is already amply geared for mechanized ground warfare. But it cannot catch up with us technologically if we choose to devote our energies to implementing a different strategy, one that calls for great creative originality. It cannot produce the millions of trained technical personnel called for by a total technological conflict. We know how German creative forces were hemmed in and misdirected by the rigidity of Hitler's dictatorship; how the continuous adjustment to new conditions required by modern warfare was stymied by fear of criticism. The Soviet society is, if anything, more inflexible than Hitler's was.

Moreover, our country enjoys immense advantages of geography and political position. These can be summed up in one pregnant sentence: *America already has the support of its entire continent.* It does not have to divert any of its energies, productivity, and resources to conquering and controlling the home base.

Russia, on the contrary, must make control of its own continent its first order of business. It must assign vast military potentials merely to keep the satellite countries and its own unhappy populations in line, and to take and maintain mastery of the whole Eurasian continent. *It is condemned to support the world's greatest army.*

Suppose that Canada and Mexico were hostile to the United States. Though we did not wish to use their territories ourselves, we could not risk their use by our adversary. That is in effect Russia's necessity with reference to Western Europe, Scandinavia, the Mediterranean countries, the Near East, southeastern Asia.

To dominate its continent Russia needs—and has been building—formidable surface power. The great Red armies must be provided with their complement of supporting aviation, today as indispensable for ground warfare as tanks or artillery. Whereas our country can restrict land forces to any degree it sees fit, Soviet Russia has no such leeway. It must keep grinding out tactical aircraft and mountains of supplies for surface action, thus reducing its ability to provide the weapons of intercontinental air struggle.

Because the priority task for the Soviet government is to deny any portion of its mainland to us, its aviation priority, too, will have to be assigned to this task. This specialized equipment will be useful against our forces approaching on the surface, on land or sea. But its use against us in the Russian skies will be less efficient than if it had been conceived and built for that purpose. The plane designed to work visually at low altitudes with and against armies cannot at the same time be endowed with peak quality for high-altitude electronic combat against attacking air forces.

We have every reason to suppose that the Russians will rely strongly on sheer numbers in their tactical air forces. They will apply the same principle of mass they did in the last war to artillery, seeking to deluge their opponents with firepower.

At a dinner given by General William H. Simpson, commander of the Ninth U.S. Army, to his Soviet opposite numbers in Brunswick, I had a chance to talk to high-ranking Red officers in their native tongue. "You Americans," one of their foremost artillery generals told me, "have accomplished what we did, but by other means. What you've done with your air forces, we've done with our artillery." In his mind the two were interchangeable.

Stalin's tacticians without doubt will demand jet fighters, fighter-bombers, and medium bombers in overwhelming numbers for Red Army operations, and from their own vantage point they will be fully justified. But this will impose a serious drain on the productive capacity of the Soviet aviation industry. To that significant extent the margins for manufacture of the instruments of strategic air combat will be curtailed. In short, where we have (or at any rate *can* have) a concentration of effort on the main object, Russian effort will unavoidably be split and diversified. In the primary contest—the battle

for air mastery—we therefore have every reason to expect to outnumber the Soviets.

Soviet Russia *must* build without limit on the surface. There is no such compulsion upon the United States, other than the psychological compulsions of habit and mental timidity.

There we have the answer to the natural question: cannot Russia mount against America the kind of interhemispheric air offensive we are discussing? The answer is definitely no. Naturally Russia can reach our cities and inflict serious damage—but so long as it must invest its manpower and resources primarily in surface strategy, it cannot provide for the sustained action necessary to win an interhemispheric air war. The Soviets are unable to generate a supreme intercontinental striking force, plus impregnable air defenses for all Eurasia, and at the same time provide prodigious tactical air forces for the world's greatest armies. Russia could release the productive capacity to create a challenging interhemispheric air force only by abandoning the idea of dominating Europe and Asia by force. But that it cannot do. Its geopolitical position makes the maintenance of supreme land power inescapable for Moscow.

Therein lies our crucial advantage—unless we foolishly choose to attempt to duplicate and match Soviet land might; unless we choose to throw away our advantage by adhering to the old formula of land-sea-air warfare. We *can* invade the Russian skies not only with qualitative but also with quantitative superiority. We can go into air battle without fear of failure through attrition. But we cannot possibly attain equality, let alone superiority, if we persist in squandering our resources on great armies and great navies.

Imagine that in the epoch of sea power the British Navy had been thoroughly beaten, but that Britain still had a great army at its disposal. That army could do nothing to save the country from defeat. With the seas in enemy hands, the army would be fully immobilized; the British Isles could be blockaded and starved into submission.

Similarly today, a nation beaten in the air cannot be saved from defeat because it still has large land and sea forces in reserve. Command of the air is the first question to be answered. If it is answered in our favor, we will have all the time we need to forge secondary

forces to any extent we may require them. If it is answered in the enemy's favor, even colossal surface forces will not save us.

Obliquely this basic principle is conceded by Dr. Vannevar Bush in his interesting book *Modern Arms and Free Men*.<sup>\*</sup> He rejects the air-power thesis and writes disparagingly of "some overexuberant air-power enthusiasts." But being intellectually honest, he does not try to evade the logic of the air-power facts.

In discussing "possible deadlock on land" (page 54), which he considers almost inevitable, Dr. Bush acknowledges that no matter how fully defended land lines may be they become useless when "one side secures air dominance." Indeed, he asserts that when air supremacy is "overwhelming," the breaking of land lines is rendered "unnecessary." Which is precisely what the "overexuberant" air fraternity is saying.

Every unit of energy we divert from our main job of decisive victory in the skies is a gift to the enemy. It cancels out that much of our natural technical and geopolitical advantage. Out of the savings made by cutting out irrelevant forces must come the American superiority also in numbers to clinch the victory.

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BECAUSE IT IS the only intercontinental bomber in our skies, the B-36 has become the symbol of the new type of war-making and the storm-center of strategic controversy. Yet every aviation engineer knows that it is by no means the last word in interhemispheric aircraft; every designer knows that this plane itself has not yet attained its maximum efficiency. But it can and will.

Through testimony at a Congressional hearing on the subject in the summer of 1949 the American people learned that the B-36 was designed before the war. Thus, while the idea of direct transoceanic air action was being ridiculed, its implement was already "in the works." It would have been available years sooner and would have been much further refined for efficiency, had the underlying idea been more generally understood and supported.

The history of this plane is worth summarizing, as an object lesson in strategic confusion.

<sup>\*</sup> Simon & Schuster, New York, 1949.

It was first projected merely as a sop to air-power "extremists." Later a quantity order of one hundred was placed by Secretary of War Patterson over the objections of his military advisers. Our disasters in the Pacific had raised the fear that the Navy might be unable to provide bases for existing and projected aviation of shorter range; had the enemy used his air resources more wisely the fear might have turned into fact. The B-36 was regarded as insurance against that eventuality, for it had the reach to hit Japan from bases in our possession, like Alaska.

As the war progressed, the acquisition of steppingstone bases for existing bombers, then for the B-29's, became the essence of our strategy. Interest in the B-36 as a military weapon faded out. By way of salvaging the investment, thinking shifted to conversion of the craft into a commercial cargo and passenger carrier.

When air-borne troops came into vogue, the Army considered adapting the B-36 into a troop carrier. Later, the Air Forces were fascinated by the project of turning it into a species of aircraft carrier of the sky, for the so-called stowaway or parasite fighter aircraft. Still later, the Air Forces edged closer to the realization that they ought to be able to hit the enemy directly from the American mainland. Since quantity production was centered on aircraft lacking the range for this purpose, the orphan child was earmarked as a flying gasoline tanker, to refuel smaller and less formidable bombers.

Some timid souls in the Air Force, eager to by-pass battle, even proposed the use of the B-36 at night only. They forgot that in intercontinental operations the route of the plane would lie across well-defended polar regions, and that the polar night is nearly six months long. By their theory, should we be attacked in the spring, the B-36 would wait until the fall, when night sets in, to retaliate. They forgot, besides, that with aircraft flying, aiming, and firing electronically, darkness has ceased to offer protection; in strategic air action the difference between day and night has in essence been wiped out.

Finally, in the last couple of years, the homeless craft has been returned to its sensible starting point—its employment in direct transoceanic operations. It thus took a decade, plus the experience of the greatest war in history, to break through prejudice, inertia, and strategic confusions to a simple acknowledgment of the obvious.



But all this blowing hot and cold, the repeated shifts in function and performance emphasis, has hardly been salutary for the airplane involved. Every revision in the expected employment of the B-36 called for corresponding changes in its characteristics, new accommodations in the balance between speed and range, defensive capacity and firepower. The end result is a plane that assuredly does not embody the acme of American ingenuity and science in the creation of a primary interhemispheric aircraft.

The recent increase in quantity production of the B-36 was fully justified. Even in its present form, the plane has the range and carrying capacity to attack any target in Eurasia from our hemisphere. Its speed at high altitudes is comparable to the best non-jet fighter planes; its lifting power is sufficient to carry the necessary firepower and bomb load for offensive action. In relation to the Soviet defensive complex today, the B-36 is realistic. But by the time this complex becomes more formidable, we must be ready with superior planes.

The present B-36 is a beginning only. It will be modified as a superb weapon of long-range strategy capable of dealing with the formidable array of new defensive hazards. Its range and speed can be extended; its wings can be redesigned for efficient conversion into a long-range jet-propelled aircraft. The B-17 was originally an adequate weapon for its time, yet we have seen that it entered the last war pitifully deficient in armor, armament, and other combat qualities. It took the pressure of battle experience to modify it into a true Flying Fortress. But let us hope that with the B-36 we will learn the lesson in advance and not wait for the prod of combat losses to make it an adequate battleplane.

Meanwhile, new and better interhemispheric aircraft are being designed. Admiral Denfeld was right when he declared on Capitol Hill that "we are today capable of producing more effective and more efficient planes for the task than the B-36." The mystery, in the light of that statement, is why the naval attack on long-range aerial strategy rests in the main on criticism of this one bomber.

Strategy frozen at any point because its equipment *exists* is foredoomed to inferiority and defeat. Our job is to plan along the curve of expectancy, with the same confidence that engineers plan bridges, highways, and rail terminals to take care of the estimated needs of the

future. We must be able to glimpse the revolutionary military implications of new technical principles *before* they have been fully exploited; to discern the functioning equipment of tomorrow in what are today mere seeds of invention. Strategic vision is related to this ability to perceive the direction of development.

Even men as passionately devoted to aviation as Colonel Lindbergh can be grossly mistaken as to the tempo of aeronautical development. Speaking in Oklahoma City in 1942, he assured his audience that only "in some future generation, fifty or a hundred or a thousand years from now, the United States may be as vulnerable to attack from Europe as England is today." His appraisal was off by from forty to nine hundred and ninety years.

Theoretical scientists, too, are sometimes inclined to underestimate the tempo of technological advances. Back in 1942, for example, Edward Warner, former Assistant Secretary of the Navy for Air and professor of aerodynamics at M.I.T., invoked the laws of physics and aerodynamics against overoptimistic proponents of long-range air strategy. They were banking on equipment not yet in sight, he argued. He cautioned against those who "seem to picture designing of airplanes as a field in which revolutionary inventions come fairly tumbling on one another's heels." \*

But inventions did come tumbling at a dizzy rate in the next few years. Reciprocal engines—using better fuels, cooling systems, ignition, carburetion, and water injection—developed nearly three times the horsepower set by him as the maximum for a cubic inch of displacement. Jet and rocket propulsion crashed through the 500 mph. which he fixed as the practical speed limit. He had "proved" that bombers flying 250 mph. would never be able to carry out missions of more than 1,100 miles; but soon thereafter the B-29's were doing routine missions with full military loads for aggregate distances of 4,000 miles, and breaking long-distance records of over 10,000 miles. The most imaginative of the air-power advocates found themselves outstripped by reality.

With this past experience fresh in mind, I am not surprised to find academic scientists today cautioning against faith in intercontinental bombing fleets. Dr. Bush writes:

\* "What Airplanes Can Do," by Edward Warner; *Foreign Affairs*, January, 1942.

In spite of the remarks of those who delight in ignoring some of the teachings of physics and chemistry when they paint the glamorous picture of aeronautics of the future, there will not be such fleets for a long time to come. . . . We cannot break the general law of physics that the faster one goes through any medium the greater is the resistance. In other words, if we want high speed we have to sacrifice range or make the craft very large. . . .\*

Anyone who may question this conclusion is dismissed by Dr. Bush as a "confirmed optimist." Yet he is as mistaken today as Dr. Warner was in 1942. Both of them reckoned on the dead level of existing scientific data, not on the curve of expectancy which includes creative inventiveness in the reckoning. It is not a question of defying physical or chemical laws but of using them in directions not instantly evident.

The fact is that airplanes have been stepping up *both* their speed and their range, and this process of dual improvement is certain to continue. Today's bombers are flying with the speeds of yesterday's fighters—and ten times as far.

Nor will planes have to be bigger and bigger to raise overall performance. The B-36, weighing 350,000 pounds, can be refined in design to attain a range of 15,000 miles. I see 500,000 pounds as the extreme limit. At that point, and probably before it is reached, aircraft will possess global range, after which *the striving for additional range will cease*. As a practical matter we do not need planes that can fly round and round the earth, except in the stunt spirit of flagpole sitters.

Thereafter, insofar as size is concerned, the process will be reversed. Planes will shrink with improved fuels, improved engines, aerodynamic refinements, etc., while retaining their global reach. Range, indeed, will no longer be a problem; it will be taken for granted. This is not the guesswork of confirmed optimism but sober expectations resting on tendencies already well defined.

Jet bombers of intercontinental range in the near future are inevitable. The present handicap of high fuel consumption in jet en-

\* *Op. cit.*, pages 117, 120.

gines is certain to be licked. Personally, I am convinced that it is a matter of only a short time before gas turbines will be far more economical than reciprocal engines, and that the fuel load will lose its present importance in fixing the military characteristics of aircraft. At the same time great strides will be made aerodynamically to allow further increase of load per square foot of wing.

When aviation enters the zone of supersonic speeds, a great many of the present assumptions and limitations will become irrelevant. Further increases in speed will not be as costly beyond the sonic barrier as they are in the subsonic zone. Corresponding expectations are justified in the field of radar, missiles, the entire complex of offensive and defensive means.

These changes will come "tumbling on one another's heels" as sure as fate. They are spelled out on the curve of expectancy.

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WE ARE TOLD that "huge, lumbering" planes of intercontinental range will be shot down in combat. That is the risk strategic battleplanes took in the last war and will take in any war, regardless of their dimensions or their point of take-off.

What of the medium-range B-29's taking off from overseas bases, or the bombers launched from carrier decks? Will they be any more immune than the B-36's? War without combat is a pipe dream. As long as destruction has to be carried to the enemy in piloted aircraft, air battle cannot be wished away. Whether it rises from outlying bases or from carriers, our aviation will still confront the enemy's defensive air complex on the ground and in the skies.

A bomber taking off from our side of the ocean is in the air some hours longer than a bomber dispatched from France or North Africa or from a carrier off the enemy's shores. The notion that it is therefore more exposed to interception, however, is an illusion.

The *danger zone*, the stretch in which it is subject to enemy opposition, is about the same no matter what the bomber's starting point may be. Within that zone its vulnerability is determined not by its bulk but by its combat vitality through proper structural design, armor, armament, maneuverability, electronic supremacy, and, of course, its accompanying protective aircraft. (The adequacy of a

bomber cannot be estimated in the abstract but in relation to the formation of which it is a component part.)

Impressed by the high speed possible with jet propulsion, some planners hope to penetrate the enemy air without combat. But that's an old story, the old temptation which met its Waterloo at Schweinfurt, Germany. As we have seen, under the duress of mounting losses, the few light guns were replaced by more guns per plane, and of heavier caliber. Additional firepower was provided by escort planes.

Thus we saw the development of the first *aerial task force* in its primitive form. This bomber-fighter combination defeated the *Luftwaffe* and took command of the skies. Effective strategic bombardment did not come into its own until it was carried to the targets by an aviation team geared for air battle.

In the next war, too, destruction will be conveyed to the enemy by an appropriate aerial task force. It will be designed to meet and overcome the highly developed electronic defenses, proximity fuses, guided jet and rocket projectiles, as well as attack by the best high-altitude interceptor fighter aircraft.

As pointed out earlier, Douhet's hypothetical all-purpose plane is impractical; the varied equipment it would need would call for more weight and space than any plane could provide efficiently. Even on water, where weight is a less crucial consideration, navies never attempted to provide an all-purpose man-of-war. They broke up the total power into component parts, with the battleship as the core, including cruisers, destroyers, later carriers, and other ships. In the aggregate their task force offered the necessary balanced strength to take control of its medium, the high seas. In the air, similarly, a specialization of function in different aircraft was inevitable, and that process will be carried further in the future as long as war is fought by man-piloted aircraft.

I do not propose to enter here into a detailed analysis of the coming aerial task force. As I have repeatedly stressed, fundamental strategic ideas cannot and should not be concealed; but as an aeronautical and armaments engineer, I am well aware that tactics and weapons belong in the province of specialists and should be surrounded with secrecy. But the general concept is so clearly delineated by the logic of inter-hemispheric war that we can deal with it in general terms.



Since command of the air, the elimination of opposing air power in the skies and on the ground, is our first goal, *combat power must take precedence over bombing power*. I have read, I suppose, everything published about the big aircraft to operate directly from our shores. Without exception, the writers consider it primarily, and even solely, as a bombing plane. Actually, its principal function will be that of a battleplane.

The bombing power it carries will be, in the first place, provocative—that is to say, geared to draw the enemy into battle. The entire industrial complex on which Soviet air power rests will rate high target priority. Unable to check off such a target as expendable, the enemy must concentrate defenses and rise to ward off attack. The bombing ingredient thus becomes provocative as well as destructive. The ratios of fire and bombing power cannot be fixed in the abstract. They will be determined by the nature of the opposing defenses. But the accent will be on battle vitality. The weapon must be primarily “a combat plane to which bombing power is added.” \*

Adequate battle capacity for modern warfare—guns, rockets, guided missiles, elaborate electronics for aiming and jamming, etc.—cannot be efficiently lodged in a single vehicle. It must be carried by several types of aircraft. The composite force should be planned and equipped to guarantee penetration and maximum attrition on the enemy's air power.

Besides the basic bomber, I can foresee auxiliary planes providing extra firepower in all its modern forms; airplanes devoting their entire useful load to electronic means for the contest with radar on the ground and in opposing aircraft, to enhance penetrating and defensive ability; planes especially designed and equipped to counteract and neutralize specific threats in the air and on the ground.

But this can be done only if we cut loose from the curious fixation that fighters and other escort craft must always be small and preferably single-seaters. Air power is already developing its own diehards; it is no more immune to hardening of the arteries than any other military service. Because the single-seater was used successfully in the last war we seem to be as sold on it as admirals formerly were sold on battleships.

\* *Victory Through Air Power*, page 313.

The coming escort plane will have a multiple crew and may be as big as the bomber. The lift it saves by not carrying bombs will be translated into greater combat and penetration capacity. The single-seater, even if it could be given intercontinental range (or if it could be provided by supporting aircraft carriers) would not necessarily be useful under the new conditions of enemy defenses.

No one can accuse me of prejudice against the long-range single-seater. It was my principal preoccupation for a great many years. Analysis of air combat at that particular stage of aeronautical development showed me the urgent need for this type of plane. Analysis today, under the new aeronautical conditions, makes me no less sure that as a teammate in long-range air battle the single-seater escort has outlived its usefulness.

This is at the root of the naval fallacy that carriers will provide escort for strategic bombers. In the future, command of the air will be assumed by task forces composed of planes of roughly the same tonnage. Such a mission simply cannot be supported by floating bases.

In the last war an attempt was made to convert some of the bombers into real battleplanes by merely adding guns and turrets. The result naturally was that performance was so impaired that the modified craft could not keep up with the unmodified bombers. Yet the idea was valid. Had the plane been further refined to provide tactical freedom to use its enhanced firepower, a sturdy and effective battleplane would have been made available. Again and again, I have seen correct and even brilliant conceptions discredited and postponed because of faulty embodiment. This slipshod experiment with converting bombers into battleplanes was just such a case.

Since the time of the First World War, I have been convinced that for maximum efficiency the escort fighter should have different military characteristics from the interceptor fighter. It must be prepared to shield the bomber, the backbone of the task force, as well as to seek out and destroy the defending fighter planes.

A fighter which can fire only forward is incapable of shielding a bomber effectively. As soon as it engages enemy interceptors, it uncovers the bomber. It is as handicapped as a ship at sea if its guns were riveted in a set position, able to shoot in only one direction.

Such makeshift escorts got by despite the handicap largely because

of fallacious tactics by the enemy. Instead of engaging them in battle at once, forcing them to shed their auxiliary tanks and drawing them away from the bomber formations, the *Luftwaffe* chose to attack the bombers directly. Thus they placed their interceptor planes between our bombers and fighters, where they were shot down with comparative ease.

Moreover, our airmen in the field showed remarkable resourcefulness. Generals Jimmy Doolittle, Orvil Anderson,\* William Kepner, and others are entitled to the gratitude of their countrymen; their decision to use fighters offensively and their skill as improvisers helped to make up for shortsighted planning at home. At the risk of incurring official disfavor, they extended range on the spot, in the course of operations, turning handicapped planes into useful weapons.

But we dare not count on improvisation and enemy backwardness in providing the escort and other accessory craft for intercontinental air struggle. The time to plan equipment and explore tactics is now. The possible enemy defense complex poses many problems, none of which is insoluble.

Normally it takes more time to develop a bomber than a fighter. Improved fighters are therefore likely to appear on both sides before improved bombers invade the skies. The defensive will enjoy a temporary advantage, unless we proceed without delay in the creation of *appropriate* escorts. We must forget single-seater precedents in evolving the vital elements for the balanced long-range aerial task force.

In the striking air formation of tomorrow, each component will have performance and military attributes planned to deal with a different and particular aspect of the overall problem, even though they may not differ greatly in general appearance. Taken together they will comprise a balanced battle force, with the necessary penetrative power, carrying a real threat to vital targets and able to impose intolerable losses on the opposing air power.

This, of course, comes close to the naval concept. What I have in view is a third-dimensional equivalent of the battleship shielded by

\* General Anderson was at the time Deputy Chief for Operations and Planning of the Eighth Air Force. Today he is the Commandant of the Air Staff College of the Air University at Montgomery, Alabama. This I consider fortunate for the country, because he is one of our clearest strategic thinkers, as well as an eloquent exponent of his views.

cruisers, destroyers, and a variety of other specialized ships of a task force. The required sum-total of firepower, bombing capacity, electronic and anti-electronic devices, etc., will not be crammed into any one plane but deployed through several. Naturally, the offensive formation will consist of a number of aircraft of each type, so that the destruction of any one plane will not strip the force of that function.

To produce this task force does not call for any new inventions. The ingredients are already at our disposal. Existing designs need only be adapted and specialized. I have made it a rule, in thirty-five years in aviation, never to propose "theoretical" planes or techniques that I cannot see clearly as practical in engineering and designing terms. Before the recent war I thus found it possible to urge long-range escort fighters. The war confirmed my expectations. With the same assurance I now urge the immediate creation of the balanced task force for interhemispheric air warfare.

Everything I have said about the offensive formation applies to defensive preparations. The decisive air battles will be fought in the entire theater of operations, over our own soil as well as the adversary's. Offense and defense are two halves of the same contest.

The next three years will be crucial. We must maintain leadership in research. On the other hand, common sense rather than inflamed imagination should guide us. We must not bleed ourselves economically in straining for fantastic results in the dim future, if it interferes with concentrated attention on pressing immediate tasks.

Those visions of artificial moons as launching platforms for rocket projectiles are imaginatively stirring, but it makes little sense to drain resources and brain power into plans so remote from the immediate challenge. Why spend millions on the hope of propelling battleships and aircraft carriers with atomic energy? What would be gained in military values? They would still remain battleships and carriers, with all the limitations this involves in the air age; a horse equipped with an atomic reactor is still no match for an automobile. The fact that atom-propelled ships may be able to sail for years without touching a port, as naval men promise, will be quite irrelevant if ships are strategically and tactically unemployed.

It has been said that the most intolerant human being is a reformed drunkard. I think he is surpassed by the reformed pessimist.

It is amusing to observe that people devoid of imagination in the past are now so impressed by their previous underestimation of scientific marvels that they tend to go overboard in the other direction. Still without imagination, they tend to recommend everything in dread of missing something.

Until now the aeronautical industry has been called upon to create endless varieties of airplanes for endless purposes: to operate with ground troops and with ships; for close-up and long-range actions; with skis, tractor landing gears, for take-off and landing on every kind of surface; for a multiplicity of tactical roles and missions. We fought a war of universal improvisation without a focused objective, seeking to destroy the enemy everywhere at once in all three mediums. Aviation mirrored this extravagant strategy.

But in the next war—unless it is deliberately held to outmoded patterns—air power will have achieved the same clarity of organization and purpose formerly enjoyed by sea power. It will be designed for the clear object of taking command of the air ocean—to overcome a known enemy, across known distances, against known targets in the air and on the surface. All our talents and capacities can be concentrated on the attainment of a single goal.

Given this new situation, American engineers and American airmen can produce air force no other country can hope to duplicate. They need only the green light to go ahead. But we cannot expect that the military “vested interests,” trained along totally different lines, will give that signal. The decision will come under the pressures of public opinion, or of major reverses in action, which may be too late.

I HAVE been following, for convenience, the now habitual semantics of referring to “strategic” and “tactical” air power, as if they were two different forces. But this distinction has become unrealistic. It is a hangover from the past, a product of the long subjection of air power to surface forces.

At the time when air power was recognized only as a weapon of the Army and the Navy, farsighted airmen were anxious to underscore the strategic possibilities of their force. To distinguish between



the aviation employed as an adjunct to surface battle and the aviation used independently, they classified the latter as "strategic." It was an oblique way of insisting that strategy based on the new force was possible.

Now that we have an autonomous Air Force, the continued use of the terms "tactical Air Force" and "strategic Air Force" seems to me misleading and unnecessary. Do we have a strategic Navy and a tactical Navy? Or a strategic Army and a tactical Army?

There have been times when navies supported land operations, or armies undertook diversive actions essential to naval struggles under way. In World War I the Russian Navy in the Gulf of Riga supported the extreme end of the Russo-German front; later the German Navy broke through and delivered the same kind of support for the Kaiser's armies in the area; off Dunkirk, Allied naval forces aided the extreme northern flank of the ground contest. No one thought of calling them a "tactical Navy." In World War II, throughout the amphibious operations, naval forces supported land actions and shielded the soldiery with its gunpower and aircraft. These actions were credited to sea power; no one thought of referring to "tactical navies."

This is not simply a verbal quibble. It cuts much deeper. Air power is air power. The concept embraces everything that makes it possible to utilize the air as a medium for transporting military power to impose defeat and surrender on an enemy. The machines, the men, the factories, the airports, the oil industries, airlines, private flying—everything entering into the aerial equation constitutes air power. The Air Force is its military end-product, and it expresses its strength through appropriate tactics and weapons to carry out its strategy. Like any other military force, air power operating in its natural medium can bring reinforcement to military forces in other mediums. But it does not thereby shed its character as a full-fledged strategic force.

The artificial division is a leftover from adolescence. Having attained adulthood, air power must throw off habits of inferiority, in order to end the confusions deriving from its former subordination. Continued measuring of our air might by "groups" seems to me another leftover; reference to forty-eight or seventy variegated "groups" defines nothing but quantity, giving no index to the character of the force.

The tactical-strategic formulation must give way to the concept of a balanced air force-in-being, organized according to function—with a *Striking* or *Battle Force*, a *Defense Force*, *Support* or *Co-operation Air Force*, an *Airlift Force*. The Battle Force may well be divided into a *Bomber Command*, an *Escort Command*, a *Penetration Command*, etc. The last-named would embrace weapons of opportunity, aircraft depending primarily on speed to attack individual targets unescorted; they would be comparable to the individual cruisers of the past, roaming the seven seas for surprise attacks on shipping and coastal installations.

There will of course be aerial reconnaissance, but I do not foresee any special planes for that purpose. Leisurely observation is no longer possible. "Strategic reconnaissance over enemy territory must be made by battleplanes, since reconnaissance means combat." \* The recent order by our Air Force of the RB-36—modified B-36 photographic reconnaissance models—is fully in line with this thesis. Naturally such planes will have to sacrifice some armor and armament to accommodate photographic and other equipment. Occasionally, surprise reconnaissance may be accomplished by Penetration Aircraft, whose role will be not unlike that played by the British "Mosquito" in the last war.

I do not pretend to be offering a fixed and complete blueprint for organization. My point is merely that the primitive division into tactical and strategic forces no longer applies. In the past, the American people did not think of their Navy as primarily a force for bombarding enemy ports, but as a fighting potential extending the nation's military power across the seas to every corner of the earth. It was a military force conceived to support national policy in time of peace, as well as a force-in-being for war.

Today the Air Force has superseded the Navy as our primary force-in-being. The sooner the American people begin to think of it not as a bombing force but as primarily a fighting force prepared to sweep the enemy from the skies and assure freedom of navigation, the sooner we shall be able to extend our national power in support of peace and to assure victory if the peace is broken.

\* *Victory Through Air Power*, page 320.

## AIR BATTLE

## 1

"THERE IS NO DEFENSE against the atom bomb." This is the explicit conclusion reached by a noted radar authority, Professor Louis N. Ridenour, in his portion of the book *One World or None*. "There is no such thing as a specific countermeasure," he warns; there can be no effective interception of the bombing aircraft.

This view runs through the whole of that rather hysterical book and is, in fact, the major premise of all forecasters of atomic doom. On the whole, the theory goes, we will be helpless against a bombing attack with the atomic explosives. Our defenses—radar screens, guided missiles, supersonic fighters, and so on—will not suffice to halt the invaders of the American skies.

This thesis naturally should hold good for all types of bombing. Clearly, if atom-bearing airplanes cannot be stopped, neither can aircraft bringing other species of destruction. Their view thus amounts to a claim that the aerial offensive has become substantially superior to any defense that can be developed against it.

But along come opponents of aerial strategy—naval spokesmen, scientists, military journalists—and insist upon a diametrically opposite thesis. The jet-propelled high-altitude fighter and guided missile, they contend, make the larger bomber plane fatally vulnerable; radar defenses on the surface will have decisive advantages over the radar in planes in aiming, firing, jamming, and tactics of deception. In short, the defensive has become so supreme that offensive action in the skies is all but ended.

The most forthright expression of this view has come from Dr. Vannevar Bush. "Great bombers," the eminent scientist argues, "are essentially fragile instruments, relatively lumbering in their flight . . ."

and incapable of surviving modern defensive action. Penetration of hostile skies has become "an appalling task for any bomber fleet." \*

The atom bomb does make a difference, he declares, since even a few sneak blows will work large havoc. "But bombing as we have known it . . . may indeed be obsolescent. The day may be approaching rapidly, if it is not already close upon us, when great fleets of bombers, at high altitudes, carrying conventional bombs against a prepared adversary, are not a warranted or justifiable undertaking in war. If we leave the atomic bomb out of consideration for the moment, we may well conclude that the defense in war is again approaching ascendancy. . . . Conventional mass bombing may be obsolete." †

These disparate claims, viewed from the American vantage point, give us a strange and ominous picture: America cannot defend itself against a bombing offensive—but Russia is invulnerable against a bombing offensive. But clearly both propositions cannot be true. Just as clearly there is a large element of truth in both.

In the light of common sense and common historical experience, the Ridenours and the Bushes, taken together, simply prove that the offensive-defensive contest—which is to say *battle*—is as valid today as it has been through the ages. Each canceling out the other's exaggerations, these scientists simply testify that there are no absolute weapons, no absolute defenses, no absolute offensive means.

The nearly foolproof defensive system with radar as its main element, described by Dr. Bush, is just the Maginot Line myth in a new version. At the other extreme, the cry that there is no defense echoes the despair evoked by the appearance of new engines of destruction century after century.

Every important new weapon disturbs the offensive-defensive equilibrium and soon generates a corrective, in a continuous seesaw. Within these fluctuations there remains the old and ever new struggle of mind against mind, skill against skill, spirit against spirit. That struggle is *battle*, whether conducted on land or sea or in the air.

The argument over the relative weight of the offense and defense flares afresh with every significant change in available equipment.

\* *Modern Arms and Free Men*, pages 48-50.

† *Ibid.*, page 56.

In our own generation so many new weapons and scientific innovations have come into being—the airplane itself, electronics, atomic energy, new means of propulsion, robot devices, etc.—that the argument naturally is sharper and more complicated than ever before.

The average person is intimidated and confused by the cascade of novelties, miracle-working devices, and technical verbiage. He swings in bewilderment from overconfidence to despondency, depending on what he last read or heard on the radio. But stripped of the esoterics of science, the relationship between offensive and defensive is what it has always been: a shifting equation in which ingenuity and readiness for sacrifice are as crucial as the weapons themselves.

Let us keep in mind this vital fact: every one of the new forces of defense is also adaptable to the purposes of offense, and vice versa. War has been lifted into a new medium—the air—inaccessible until our epoch; yet within that medium its basic rules remain essentially the same.

We have demonstrated that in any new conflict mastery of the air space will be indispensable, no matter what strategy a nation adopts. As between countries on different continents, this battle for air control cannot be by-passed or postponed, any more than the contest for control of the seas could be avoided in an earlier day between nations separated by water. Whether we approach the hostile continent from our mainland or from overseas bases, from fixed platforms or floating platforms (carriers), our aviation will meet the same enemy disposing of the same complex of defensive strength.

Those who insist that long-range aerial strategy "may be obsolete" because of ascendant defensive installations are really saying that any kind of air action over enemy soil is obsolete. Enemy skies would be even less accessible to short-range bombers from overseas bases or from carriers. With offensive aviation thus ruled out, with the skies conceded to the defender, his continent would be impregnable against troop landings or any other strategy.

It is understandable, therefore, why the layman is left hopeless by analyses such as Dr. Bush's. Land war, this scientist shows, can lead at best to a deadlock. Air offensive is no longer justifiable and certainly, in his view, hasn't the vitality for victory. He sees a rise in the potentials for underseas warfare. But this is meaningless, since against



another continent control of the seas can only be a prelude to the land contest he has already eliminated.

Dr. Bush is one of the great scientists and administrators in his own field. But that does not necessarily make him an authority in the science of warfare. In any case, I cannot accept his analysis. In the air as on the surface, the defensive may impose a temporary deadlock but it cannot win a war. Now, as a thousand years ago, the military forces shielding an enemy's war-making heart have to be neutralized or destroyed. This can be accomplished only by bold offensive strategy, even though the cost may be high. Now, as a thousand years ago, everything else being equal, the assault is normally more difficult and more costly than digging in for resistance. But there is no other way to overcome an enemy in physical combat. Only offense can win a war, and consequently offense is cheapest in the end.

The relationship between an attacking air force and ground defenses is not unlike the past relationship between naval force and coast artillery. Shore-based artillery was always superior to its ship-borne opposition; it had longer range, more accurate range-finders, and it fired at targets operating in perfectly charted waters.

Yet shore batteries were never able to make a country impregnable. The fleet had the inestimable advantage of the initiative, bringing a concentration of power against a given shore point. In instances where the defensive power was too great, the attackers ignored the target temporarily, isolating it by striking at other points.

The air over an enemy country, defended by air force and every type of defensive weapon, is a fortress to be stormed, breached, and neutralized. The attacker must possess the vitality—in quantity and quality of equipment and personnel—to challenge the entire defensive setup; to inflict attrition beyond the defender's capacity to absorb and at the same time to annihilate the sources of his power on the surface.

That vitality is well within the limits of our American aeronautical and human potentials.

THE LAST WAR in the air was won by a task force consisting of bomber and single-seater fighter. Even then the single-seater was not the perfect answer. We got away with it only because of the aviation shortcomings of the enemy. In any case, the fighter served as a "detached turret," bringing additional firepower to the battle, and applying it at longer range. It was not expected to bring anything more.

In the next war, as I indicated in discussing the aerial task force of the future in the previous chapter, we will have to convey to the theater of action not only extra firepower but additional electronic power—to counteract the defensive radar, to help in sighting and firing, to explode the proximity fuses prematurely, to apply deceptive tactics. To house the necessary potentials—not only for attack but for its own defense—each plane in the penetrating force will have to be far more complex than the single-seater escort.

Speeds are now so great and altitudes so high that visual aiming is out of the question. Radar sights, radar firing, radar guiding of missiles are so important both at the attacking and defending ends that *the electronic struggle becomes as fierce and its results as decisive as the firepower duel*. The paraphernalia for this electronic engagement are beyond the capacity of small aircraft. Whether it comes from a distant base or an aircraft carrier, the single-seater as a partner in the long-range strategic team is out.

In emphasizing the advantages of the defense, Dr. Bush points out, rightly, that the heavier and better deployed radar installations on the ground are necessarily superior to the installations in aircraft. The defender can jam electronic sights and make bombing inaccurate; he can guide his fighters from the ground to the intruding planes to pump explosives into the bombers. Others have advanced the same argument.

But curiously they fail to follow the same reasoning when it comes to the relationship between a large bomber and a small fighter plane. The latter can be guided toward the vicinity of its target in the air by means of ground devices. But after that it must maneuver itself electronically into position for firing. In that time of confrontation it is on its own, dependent on its own sighting, firing, and other radar

instruments. Yet its electronic means are negligible compared with those of the big plane.

At that juncture—and it is the critical moment—the bomber has the same electronic superiority over the fighter that ground installations have over airplanes. The disproportion, indeed, is even greater: the distance between the two airplanes is slight compared with the miles between the ground and the bomber.

Electronic power, of course, grows with increased size and weight of equipment, but its effect declines in inverse proportion to the square of the distance. The closer the small plane comes to its giant adversary, the weaker it becomes electronically. If the bomber, as Dr. Bush argues, has no chance against ground installations, then the fighter plane by the same logic has no chance against the bomber installation. It will be unable to use its radar sighting against the jamming action from the target plane; it can be made blinder than a bat.

The immense speeds of the jet fighter mean a huge arc in turning. The small plane can make only one "pass" and release one salvo as it streaks by. The view prevails that this gives the tiny defender an advantage. In truth the advantage is on the side of the big bomber, which can fire while the fighter is maneuvering into a shooting position. Its answer is a single burst against a close-up and maximally vulnerable target, with its elaborate electronic means focused against a plane which is necessarily inferior electronically.

In that momentary meeting of bomber and fighter, who can sight better and jam better: a group of men in a spacious bomber equipped with maximum technical facilities, or the pilot in a single-seater plane, crammed into his cockpit with a shoehorn, obliged to fly and aim and shoot with his two hands and feet?

In pre-radar days, in a corresponding confrontation of fighter versus bomber, the sighting means of both were the same—the human eye. The main differential was that the bomber offered a larger target. But now that the whole exchange is by instruments, the small plane is completely outclassed.

The seeming advantage of the fighter's immense speed is really an illusion. In the split-second of contact, when salvos are traded, the airplanes may be regarded as stationary and the battleplane is incomparably superior in fire and electronic power. There is every reason

to expect that the bomber of the future, if properly conceived and equipped, will be more deadly to fighters than in the past.

Speed, after all, is a highly relative value. Speeds that are impressive in relation to the ground lose their impressiveness as between fighting aircraft themselves. Before the last war it was widely predicted that aerial "dogfights" in the World War I style were a thing of the past. Planes moving at three hundred miles an hour, it was thought, could not maneuver for individual combat in the manner of planes that moved at only a hundred and fifty miles an hour.

However, flying my own fighter, then the fastest in the skies, I readily visualized and even demonstrated a dogfight with an opponent of roughly similar speed. True, some of the spectacular acrobatics were difficult; the radius of turn was greatly enlarged; but relentless pursuit of an enemy remained a fact. Actually, combat was conducted at speeds of over four hundred miles an hour, and produced a bright galaxy of "aces" like Bong, Gabreski, Foss, Zemke, and quite a few more.

It is amusing to note that the prediction of the end of dogfighting and "aces" is once more being voiced, and for the same old reason—that jet planes fly too fast. And again, having piloted jet fighters, I am convinced that combat will continue as long as planes are flown by men.

In testing the British single-seater jet fighter, the Vampire, for example, I was able to do all the acrobatics which are possible in a conventional propellered plane, besides some which cannot be done with the older model. I actually found them easier to operate. With no propeller, carburetor, or ignition, there are fewer sources of trouble and fewer cockpit gadgets to watch. In level flight there is no sensation at all. As I wrote in a magazine article:

The nearest comparison would be the feeling when one is flying a motorless glider—if it were making five hundred to six hundred miles an hour. The seeming absence of all motion is the dominant impression. Sitting up there, making almost ten miles a minute, I thought of what this meant for the future of aviation. For the first time humanity has attained a mode of travel without vibration, noise, or dust. Air travelers in the jet era will rest back in

their seats or beds in greater quiet and peace than in their own parlors or bedrooms. They will arrive at their destinations fresh and rested.\*

Individual combat will be the order of the day as long as speeds remain subsonic; that is, less than seven hundred and fifty miles an hour at sea level. When both sides have approximately equal speeds, the relationship remains essentially unchanged; only the dimensions of the space in which they maneuver are widened. Of course, when supersonic speeds are involved the craft becomes more of a projectile than a plane; even then individual combat is possible under certain conditions.

One consequence of the general increase in speeds is that flank attacks become highly difficult for fighters; they must rely largely on frontal and rear attacks in firing on bombers. This in turn tends to limit the bomber's defensive needs to fore and aft installations, which can be readily built into the modern bomber without impairing performance.

Despite a widespread belief to the contrary, the jet aircraft flying at near-sonic and supersonic speeds offers greater design leeway, particularly with respect to powerful rear defenses. It is an interesting aerodynamic fact that the faster an airplane travels, the less sensitive are its "trailing" or rearward elements to irregularities of contour. As a result there are greater design opportunities in high-speed aircraft for "blisters" to house additional firepower.

Fighters have always overtaken bombers in the past and will do so in the future. After that, speed loses its importance. Firepower becomes the paramount consideration. A man being pursued is dependent on speed, but once he is cornered he must stop and shoot it out; if the chances of his being caught are overwhelming, he would be ill advised to go unarmed. By the same logic it is wrong to strip bombers of combat vitality in order to gain speed. Whether the cornered bomber survives will be determined, in the showdown, by its resistance to battle damage and its firepower.

Recently it was reported that the Royal Air Force considers "the gunners of the bomber crews obsolete" because planes now move

\* "Jet—Tomorrow's Plane," by the author; *Pageant*, April, 1946.



too fast "for accurate shooting by a man in a bomber gun turret." In the future, the account continued, "Britain expects to have bombers relying solely on speed, great altitude, and evasive action to avoid being shot down by fighters." \*

If this dangerous fallacy is in fact the R.A.F. decision, it attests that people do not always learn from experience. We have seen how some planners before the last war similarly counted on flying "so fast and so high" as to evade battle, until heavy losses convinced them of their error. Air battle, in the immediate future, cannot be obviated by speed and altitude. While the firepower at their command will be different in character, gunners are not "obsolete." No edict of any aeronautical authority can count them out. If anything, "gunnery" will have an increasingly significant role.

Machine guns and cannon as we know them today may be replaced by rocket and other rapid self-propelled missiles of all kinds outmoding the conventional turret. But new accommodations will be designed for the new firepower. It is likely, for example, that the modified turrets will be retractable. Thus they will not handicap flight in the evasive phase of the action, and will be extended in the combat phase, when high speed is no longer vital and may even be detrimental.

Ingenuity in providing the new features demanded by the new weapons and conditions may prove as decisive in air battle as clever disposition of turrets, elevation of guns, and other features in naval ships proved in sea battle. Superior brain power, expressed in technological devices and tactical innovations, must remain valid in aerial warfare as long as planes are man-piloted. Only the emergence of supersonic intercontinental robots may change this fact.

THE standard mental image of a big bomber assumes a fragile egg-shell ready to burst from internal pressure and doomed if hit by a single projectile. Dr. Bush mirrors this idea when he asserts that "the high-altitude bomber with its pressurized cabin is decidedly vulnerable if hit at all." He fails to note that the cockpit of the opposing

\* Associated Press, November 11, 1949.

high-flying fighter is likewise pressurized and therefore no less vulnerable.

But this picture is contradicted by the reality of the properly designed bomber of our day. Recall how the battleship, to meet the perils of enhanced artillery fire and torpedoes, became ever sturdier, ever less sinkable. First it increased its armor, but in time a point was reached where it would no longer float if it were to don additional armor. What happened? Ships were then structurally divided into a number of compartments, so that damage to one did not put the whole vessel out of commission. They were redesigned in other ways to absorb more punishment and more types of punishment.

An analogous process is already under way in the design and equipment of big battleplanes, though much remains to be done. The bulk of the bomber provides a larger target, but it also endows the plane with more defensive vitality. It has space for more and more defensive measures, both structurally and in the way of instrumentation. It has the carrying capacity for necessary counterequipment to deal with various enemy actions.

For instance, all the essential controls of the plane—engine, navigation, firing, flight controls, etc.—can be electronic or electrical, and thereby virtually immune to severance. The majority of bombers in the last war were disabled or brought down by severance or wreckage of one or another of the control connections.

The Indian could interrupt the white man's communications by cutting telegraph wires, but he would have been unable to cut radio beams. Even this additional safety against interruption of controls will be provided within the bomber as wires and conduits are replaced by electronic controls. This should enable the big plane to survive anything but direct hits on its engines, flight-control surfaces or devices, or the crew itself.

The advantage of the greater accuracy of the proximity fuse is in this way balanced by greater invulnerability at the target end, demanding terrific increase of the volume of anti-aircraft fire. (Interestingly, electronics is at the roots of both improvements.) In eliminating all rods and other mechanical connections there will be a substantial saving in weight. The mechanism making possible this substitution is negligible in relation to the gross weight of a bomber;

but its weight and bulk are prohibitive for a fighter plane. This is another vital element of superiority of the large over the small aircraft.

In the past, navigation and detection of the enemy, as well as firing, were visual. Now that they are automatic, better location and protection of the crew of the big plane in combat becomes feasible. The conventional cockpit—the fragile glass greenhouse on the nose of the airplane—will hereafter be used only for routine flying, take-off, and landing.

Like the open deck of a battleship, it will become untenable in time of battle. The crew will then retire into a relatively small command post within the heart of the aircraft: a heavily armored and pressurized compartment, subject to penetration only by big projectiles at close range. Damage by smaller missiles would be automatically plugged—through self-sealing devices—so that pressure could be maintained.

My point is that once the strategy of intercontinental air warfare is accepted as inescapable, the evolution of equipment to match will follow swiftly and intensively. The necessary scientific ingredients are at hand. The design problem will in many respects be simplified, because the battleplane will have to fly and fight under a known set of conditions—against known and predetermined targets, from known and predetermined bases.

It will no longer be a universal weapon, expected to work equally well from the North Pole or the Equator, from jungle lands or the Sahara Desert. It will come closer in conception to a piece of siege artillery, wheeled into position for operations against a definite target. Many of the design compromises that in the past made it an all-purpose bomber can consequently be dispensed with.

Consider the take-off and landing problems. Heretofore we required large, solid, and expensive airdromes with smooth concrete runways, which could not be provided quickly in operational theaters under threat of enemy action. The tendency was therefore to load down the plane with ever more elaborate and sturdy landing gears for rough surfaces. Caterpillar gears were designed. All this added weight naturally took a toll in performance, to a degree where the bomber ceased to be an efficient instrument of long-range strategy.

Now that the plane will take off from its home base and return to

it across the ocean, the process can be reversed. The bomber can be stripped of all superfluous encumbrances, with sensational savings in weight.

There is the possibility of dispensing with landing gears altogether. The mechanisms for taking off may be installed on the ground—the present catapult gives a hint of the potentials opened up by this design principle. Landing devices to receive the homebound plane in its lightened condition are a possibility. The landing gear on a B-36 together with all of the paraphernalia, including structural re-enforcements for stress distribution, must weigh roughly ten tons. Their elimination can extend range by twenty per cent, or provide carrying capacity for about twice as much firepower and ammunition.

Other areas of development are opened up with the application of jet and rocket propulsion. Heretofore, to cite an example, water-based planes were less efficient than land-based versions. Because the propellers had to clear the water, the cross-section of the plane was greatly enlarged, producing parasite drag and cutting performance. With the advent of jet and rocket motors, the picture may change radically in favor of the water-based craft.

In a letter to Secretary of War Patterson, dated June 9, 1947, I noted that "it will be possible to design a jet-powered water-based aircraft that will outperform jet-powered land-based aircraft of the same horsepower in speed, range, and carrying capacity," and that will enjoy tactical advantages. Water offers unlimited area for dispersal of planes, so that an attacker cannot immobilize a large amount of aviation with a single bomb. The planes "in port" can be deployed with miles of space between them, making them unprofitable as atomic targets and imposing a major attack problem on the enemy with any kind of explosive.

"In the final analysis," as I informed the Secretary of War, "it does not make any difference whether an aircraft rises from water, from land, or from catapult," whether its base is fixed or mobile: "The important thing is what it is designed to do after it becomes air-borne."

When designed to enhance the efficiency of ships, a plane belongs to the Navy; when designed to join air battle for command of the skies, it is a weapon of the Air Force. Consider, for example, the new Consolidated flying boat XP-5Y-1, powered by new turbo-prop en-

gines. If it has been designed as a flying tender, to service ships, it is of course a piece of naval equipment. But if it is a veritable "flying cruiser" armed to the teeth, as heralded by the press, then it is traveling in the wrong company. Though it rises and alights on water, it clearly belongs to the Air Force.

I trust this will suffice to indicate that, contrary to prevalent notions, the large airplane should be able to take tremendous punishment without hurting its ability to accomplish its mission. There is no excuse for the defeatism voiced by those who are overawed by the new defensive devices. Let us remember that the battleship reigned supreme on the high seas until its nemesis came *from a totally different medium*. The battleplane, similarly, will remain supreme in the air as long as conquest of this medium is decisive—until, that is to say, some totally new method of projecting destruction through space is discovered, after which land, sea, and air forces alike would be superseded.

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THERE WAS an ironic element in one part of the testimony of the admirals in the famous Congressional hearings in October, 1949.

Ever since Hiroshima, they had maneuvered for a role in delivering the new atom bomb in any future war. Far from ruling out strategic mass bombing, they had insisted that carriers are best equipped to exert that kind of force. The supercarrier was projected in the first place as a base for deep strategic penetration of the enemy heartland with atomic and other destruction. But now the Navy spokesmen suddenly declared that long-range strategic bombing, and more specifically the use of the atom bomb, was immoral, inhuman, self-defeating.

The admirals were apparently allowing partisan zeal to mislead them into insisting that precision bombing—the alternative to indiscriminate mass bombing—is not possible with long-range planes. But if that were true, why would they clamor for supercarriers for penetration to land targets? Surely the range of the battleplane need not affect its bombing characteristics. If precision bombing were ruled out for big bombers, like the B-36, it would be forbidden no less to smaller bombers, like the new North American AJ-1 and Lockheed



Neptune of the Navy. In fact, under the new conditions of electronic contest and guided missiles, the invading plane must be large enough to carry adequate facilities for electronic sighting, aiming, and defensive tactics.

But it happens that giant technological strides have been made in the accuracy of bombing. In the next war targets will be picked out as precisely at forty thousand feet as they were in World War II at four thousand feet. Both sighting and missiles are being improved at breath-taking rates.

In discussion of guided and self-seeking missiles people tend to think only from the ground up. But the weapon is just as valid offensively: from air-to-ground as from ground-to-air. It is no secret that free-falling bombs will soon be things of the past. More and more, airplanes will rely on rocket-driven projectiles: in effect, V-2 missiles fired downward.

Admiral Blandy, in his testimony on Capitol Hill, had much to say about ballistic winds in bombing from eight miles up. But those winds will equally distort the defensive fire against bombers from the ground. Besides, the Navy itself is firing at distances of twenty miles and more. In such exchanges the shells reach heights of nearly eight miles and must contend with distortion by ballistic winds in ascent and descent.

A V-2 projectile weighing fourteen tons and carrying one ton of explosive can be fired upward a distance of one hundred miles, attaining a mile-a-second speed in sixty seconds. Now visualize the same V-2 fired downward, where the thrust does not have to overcome fifteen tons of weight and is, indeed, assisted by gravity. Under those conditions the rocket motor can be much smaller, the explosive war-head much larger, the terminal velocity reached more quickly. As against the full minute in fall by a conventional bomb from an eight-mile altitude, this missile will reach its goal in a few seconds. The ability of the defenders to evade it will therefore be cut down decisively.

Unlike its conventional forebear, the self-propelled bomb does not oblige the airplane to take a predetermined position to score a hit—a position even better known to the defender than to the attacker. This obviously will give the offensive greater tactical freedom, while mak-

ing defense measures more complicated and less accurate. The projectile will come from an unpredictable direction at an unpredictable time. Public attention has recently been focused on the stepped-up efficiency of artillery through such new weapons as the lightweight recoilless gun, shaped charges, and even atomic shells. These important developments have been advertised by Army spokesmen in particular, in the hope of resurrecting the strategic role of ground forces. But actually, every one of these weapons will be much more significant in enhancing the striking force of air power against surface targets.

Saving weight on the ground is not decisive. But in the air the availability of "weightless" large-caliber artillery, represented by recoilless guns, will be of incalculable advantage. Conventional shells of the proper caliber are already sufficient to penetrate the light armor of aircraft, and their improvement will not substantially change the existing relationship. But shaped charges will make possible the penetration, from the air, of the largest tanks and the heaviest armor; air power will acquire the ability to pierce anything that rests or floats on the surface of the earth. Thus the armament gain for the ground forces will be more than compensated for by a far greater gain in the effectiveness of aviation operating against them, and the margin of dominance enjoyed by air over surface forces will be further expanded.

Radar devices first took over the job of visual detection and aiming in the defense of Britain against the *Luftwaffe*. It was the first and the most telling intellectual surprise of the conflict and played a large part in defeating the German invasion of the skies. The radar warning system helped compensate the defenders for their numerical inferiority in the air. It enabled them to place their superior fighters in adequate numbers in the right places at the right time. Unaware of the electronic innovation, the Germans thought they had miscalculated the size of the British air forces. No matter where they went, formidable formations of Spitfires and Hurricanes rose to meet them.

By this time radar is standard equipment. The problem of stepping up aiming accuracy has become less formidable. Highly accurate high-altitude bombing by electronics will seem no more astonishing tomorrow than the very idea of "bombing without seeing" by elec-

tronics seemed yesterday. In this art, as in military equipment generally, the curve of expectancy will inevitably be followed.

As larger attrition is inflicted on enemy air forces, as his communications are reduced and his ground resistance weakened, the invading air forces will come lower and lower. Effectiveness of bombing will in the same degree be increased, to eliminate the pertinent targets at an ever faster tempo.

With modern devices, however, maximum accuracy does not require the bombers to fly at treetop levels. Peak performance will be possible from relatively high elevations. When General LeMay brought his B-29's down from thirty thousand feet over Japan to seven thousand feet, he discovered that he was "too close to the deck" and ascended to ten thousand feet. It was not enemy action that forced the revision but the fact that the electronic equipment was more efficient at ten thousand feet than on lower levels.

This is another example of tactics as a function of technology. We have been accustomed to thinking of bombing in terms of a stone being hurled at a window, with distance as the controlling factor in accuracy. But such mental stereotypes are irrelevant in the electronics age. Altitude has lost much of its former significance. Precision bombing of unprecedented accuracy will inevitably be developed.

Electronics will have another profound effect on the war of the future. Since recognition of the enemy, aiming, and firing will all be done by radar, "the difference between day and night operations in the air will disappear," as I wrote as far back as 1944. The immunity once provided by fog, clouds, and darkness will be wiped out, in effect turning night into day.

WE ARE WARNED that an invading force can be deceived by visual and electronic camouflage and misdirection, which is true enough. However, a wide range of deceptive tactics will also be available to the attacking formation.

The "window" procedure used so effectively in World War II was no more than a sketchy preview of the future. The strips of aluminum foil released to jam anti-aircraft aiming by producing crazy pat-

terns on radar screens were only the primitive initiation of an array of future deceptive procedures that will throw the defensive ground devices into confusion.

The proximity fuse, set to explode automatically, is a remarkable invention. But it remains a mechanism without human intelligence, which can be easily fooled. Without revealing specific possibilities, it should be apparent that "windows" can be worked out to detonate those fuses prematurely. In addition, it is entirely conceivable that invading aircraft will trail, or be preceded by, thermal, magnetic, and electronic decoys that will draw off homing projectiles. Planes can tow—or even fire forward—a variety of decoys to jam, deceive, and otherwise disconcert defenders on the surface.

"Marker planes" to identify bombing sites were employed with signal success by the British. I consider the parasite or stowaway plane—a tiny craft released by the big or "mother" plane—futile in the role of escort fighter. (To offer genuine defensive power the "mother" craft would have to carry dozens or scores of fighters.) But it is not beyond possibility that bombers (or other planes in the task force), on approaching the target, will release supersonic stowaways as "markers." Using tremendous speeds to evade interception, these will mark the spot, not necessarily visually but with thermal or electronic instruments emitting rays or signals. Bombs will then find their goals before the defenders can locate and neutralize the markers.

Pessimists on air offensive place greatest stress on the guided missile, propelled from the ground by jet, ramjet, or rocket engines, as the nemesis of the bombing plane. They picture these gadgets streaking through the sky at tremendous speed, sensing their way to the plane by means of homing devices, and crashing unerringly into it.

The matter is not so simple. Not only can guided missiles be decoyed and their seeking instruments jammed, but counterdevices instantly suggest themselves.

A proximity fuse detonates the projectile at a predetermined distance from its target. Invaders can use the same technique to make the missile, when it approaches within a given distance of a moving airplane, release electronically a corresponding rocket missile in the bomber. The incoming projectile will automatically "pull the trigger" on a counterprojectile, which will meet the incom-

ing menace head-on, as accurately as the guided missile was expected to hit the bomber.

As we enter the domain of supersonic speeds in planes and guided projectiles, both firing and counterfiring will tend to become automatic. Bombers will no longer depend on human senses to detect hazards. Guided missiles traveling at a mile and more per second will be confronted with electronic devices working at the speed of light, or 186,000 miles per second.

Furthermore, missiles moving at high velocities develop too much directional momentum to swerve sharply in their course, despite sensitive homing devices. They cannot "pursue" a target which changes direction or speed when within range; the rate of angular change is too high for this momentum. The bomber, equipped with electronic warning instruments, will be able to "step aside" with the same agility that a toreador, by a scarcely perceptible move to one side, evades the momentum of the charging bull.

The revolution in the basic character of defense methods can be conveyed in two key words—*pursuit* and *collision*. In the subsonic era defense meant pursuit. You chased the enemy, overtook him, and destroyed him. Where supersonic speeds are involved, this becomes impractical. Even a margin of speed superiority generally will not improve matters. There will not be time enough to detect the hurtling danger (whether robot or piloted), sight, and fire.

Pursuit therefore gives way to collision. The oncoming threats are detected and answered automatically. The supersonic craft, even if man-piloted, cannot deviate *sharply* from its course and therefore has to follow a fairly definite trajectory. Therein lies the chance of defensive action. The defense missile can easily establish the constant "course of collision," and "home" toward the oncoming missile with the same precision as the latter is homing toward the target.

I am not prescribing specific devices or tactics, of course. My purpose in sketching out possibilities roughhand is simply to underline the truth that there is no absolute protection and no absolute menace; the potentials in offense and defense alike are almost limitless.

The atomic bomb itself, where the target justifies the investment, may be used as a purely defensive weapon by the invading formation. Exploded at appropriate altitudes it will temporarily saturate



defenses below, handicapping all electronic and other sensitive instrumentalities. Using rocket-driven bombs and guided missiles, the bombing force does not have to pass directly over the target area and will not be contaminated by the atomic clouds. The feasibility of such a tactic was apparent to me as I flew over Bikini during the experimental atomic explosion. The stowaway supersonic plane, too, can be used to deliver that atomic bomb—if and when the missile is made small enough for this purpose.

Because of its size and the rigidity of the formation, the bomber's evasive possibilities used to be limited to change of direction. Tactics based on change in speed were impossible since the spread between low and top speed was too slight. Today the bomber has a capacity for flash performance through after-burners in jet and through rockets. It can suddenly accelerate speed or use the same device as a brake for sudden deceleration, with the entire formation speeding up or slowing down as a unit.

Every driver in heavy traffic knows what happens when he steps on the gas or applies the brakes without warning; how the surrounding cars are bewildered. That's the kind of maneuvering in the sky made possible with rocket and jet propulsion. Planes flying at six hundred miles an hour can suddenly slow down to two hundred miles, and immediately thereafter return to the six-hundred-mile pace, throwing the range, sighting, and supersonic missiles of defenders out of kilter. Bomber formations need no longer approach the target on a steady course or at a steady pace. The initiative both directionally and speedwise lies with the attacker, to the detriment of the efficiency of defenders both on the ground and in the air.

Sighting and release of bombs may well be controlled from a specialized electronic aircraft, not the bomb carrier itself. In this case the bomber would be equivalent to a preloaded magazine fired by gunners in a separate plane. It is feasible, and may become necessary, to make this plane radio-controlled—a "drone"—brought in under the protection of the task force. Such a plane could do the actual bombing, especially if it has to be sacrificed in the process. (This use of the drone as a weapon of air force, of course, should not be confused with the naïve attempt to guide lone and undefended subsonic robots across thousands of miles.) Interference with communications between

component aircraft in a formation will be difficult; due to the short distances involved, the advantage of electronic and other means will always be maintained in this respect by the attacking force.

There are no limits to the cunning that can be used. Admittedly every offensive stratagem to which I have alluded can also be adapted defensively. Neither offense nor defense can be labeled as ascendant or obsolescent except during brief periods of adjustment. Americans should not be confused and disoriented by the atmosphere of scientific wizardry around modern weapons. It is still brain against brain, stout heart against stout heart, and the fact that the contest is technological means that the advantage is on our side.

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THE FOREGOING technical discussion has been brief, incomplete, and in some respects deliberately vague in the interests of security. But it at least hints at the surpassing advantages, in such a war, of America's stupendous technological heritage.

Any nation, of course, can train a number of specialists to operate efficiently a limited amount of modern weapons. But we are visualizing an effort involving not thousands but literally millions of highly trained people on the ground and in the air. Such technological armies cannot be created overnight. Only America can mobilize quickly millions of people already conditioned for the task, people who from childhood up have been familiar with scientific gadgets and can be expected to be technologically resourceful under battle conditions.

While combat in the air will require immense skill and technical initiative on the part of crews, the ground and behind-the-lines organization will be vastly larger and more complex. For every man in the air, it was estimated in the past, there were fifteen men in supporting roles on the ground. In the more scientific contest of the future this spread will be much wider. It takes more technological experience and knowledge to maintain gadgetry than to use it.

Books, films, and broadcasts have given us a close-up view of the actual fighting in the air in Europe and the Far East. Not enough has been done, unfortunately, to make Americans aware of the magnitude and accomplishments of the supporting organizations behind the

scene, on the ground. Take, for example, the Eighth U.S. Air Force in England. Its battle and bombing records are fairly well known. But few are able to visualize the amazing array of maintenance, operational-research, administrative, and other activities without which the air action would have been impossible. These assessed and interpreted the targets, enemy ground and air defenses, weather, a hundred other related elements.

The mountains of data were tabulated by a series of business machines of the same fantastic efficiency as those standard in American industry. The offices in Quonset huts and modest buildings in which the work was done looked more like a segment of some large insurance company than a vital war operation. The target having been chosen, punctured cards sped through business machines and provided instantaneous calculations as to the number of planes required, bombloads, amounts and types of ammunition, gas and oil loads, and ratios between demolition and incendiary explosives. Information on the known and likely defenses, fed into machines at one end, produced information about required escort forces at the other. Endless calculations which would have taken hours or days were made almost instantaneously and with less risk of error.

The immense volume of accounting and tabulating and estimating would have done credit to General Motors or Sears Roebuck. It was the sort of thing that no relatively backward country can hope to duplicate, whether in scale or in smooth-running efficiency. This distinct American advantage holds true at every stage—from the designing of a weapon, to its manufacture, to its effective use. The aggregate effort is so gigantic that it must rest on a population completely at home in a modern machine civilization. In contrast to the primitive hand-to-hand combat which is the essence of surface war, the aerial war of tomorrow will involve a contest of technologies. The distance between them is as great as between a village handicraft shop and a great modern automotive plant. The further we move from the bayonet, the more decisive is America's advantage.

Another element of American technical advantage is more important in the equation than generally realized. Both commercial and private flying have attained vast dimensions; no other country comes within eighty per cent of us in this respect. We are fast becoming a



**THE B-36 IN FLIGHT:** The first weapon of interhemispheric warfare, it freed air power from dependence on overseas bases, and laid the foundation for a true air strategy. Note wing-tip "pads," each housing two jet engines for enhanced performance over target areas.

**B-29's POISED FOR ACTION:** Behind them, an amazing array of maintenance, operational research, administrative and other activities, the product of American technology and efficiency. The immense volume of accounting and tabulating and estimating would have done credit to General Motors or Sears, Roebuck.



*U.S. Air Force photo*





*Wide World*

**ORIGINAL FLYING FORTRESS:** This B-17 in its first model was conceived by the Air Corps as an instrument of strategic air force. Unfortunately, it was stripped of combat vitality by Washington planners, in the naïve hope that it would fly “so fast and so high” that it could bomb without interception. It has no tail guns or turrets; its machine guns are housed in blisters which open and expose guns to the slipstream when fired. It is streamlined for maximum speed.

**B-17 GROUP, 1941:** Flying Fortresses consigned to England. Note that even gun blisters were removed to increase speed. These defenseless planes were easily destroyed, contributing to British lack of faith in daylight strategic bombing.



*Wide World*





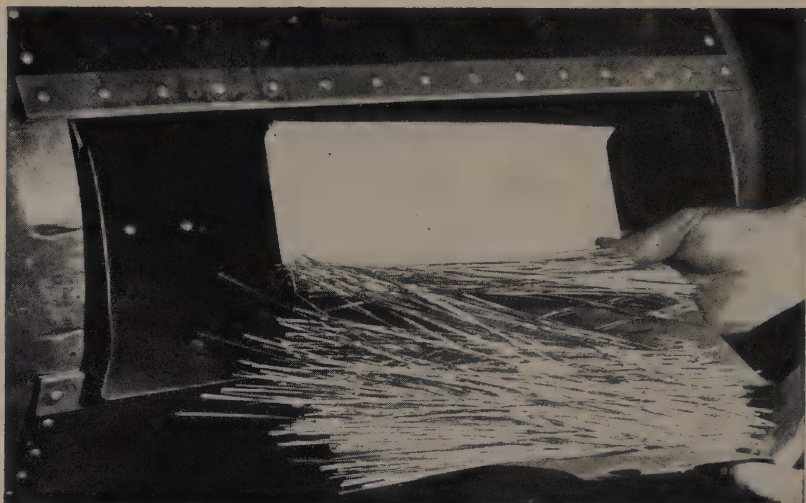
*Wide World*

**B-17 AFTER BAPTISM IN BATTLE:** After sad British experience, the Flying Fortress donned armor and armament. Note tail guns, belly gun turret and topturret—but it is still vulnerable to frontal attack.

**B-17 AT WAR'S END:** With chin turret added, the bomber finally had evolved into a true weapon of strategic air power. Supported by escort fighters, in due time it gained control of the air over Germany.



*Wide World*



*U.S. Air Force photo*

**PRIMITIVE "WINDOW":** These aluminum strips, dropped by the lead plane in a formation to blur enemy radar images, marked the beginning of the fight for electronic right-of-way, which in future warfare will be as decisive as firepower.

**PARASITE PLANE:** A Superfortress releasing a supersonic rocket plane, the X-1, from its underbelly. Such stowaway or parasite craft can be used as marker planes, as well as in delivery of atomic missiles for saturation of enemy defenses, preceding the main striking force.



*Wide World*

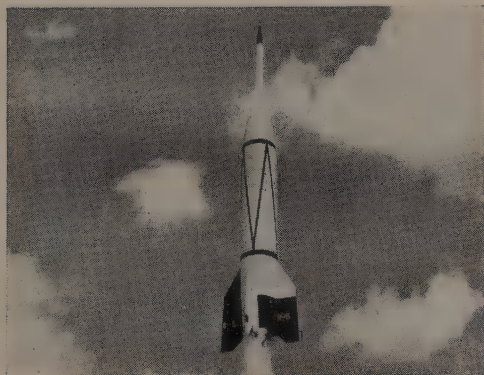


*Dept. of Defense photo*

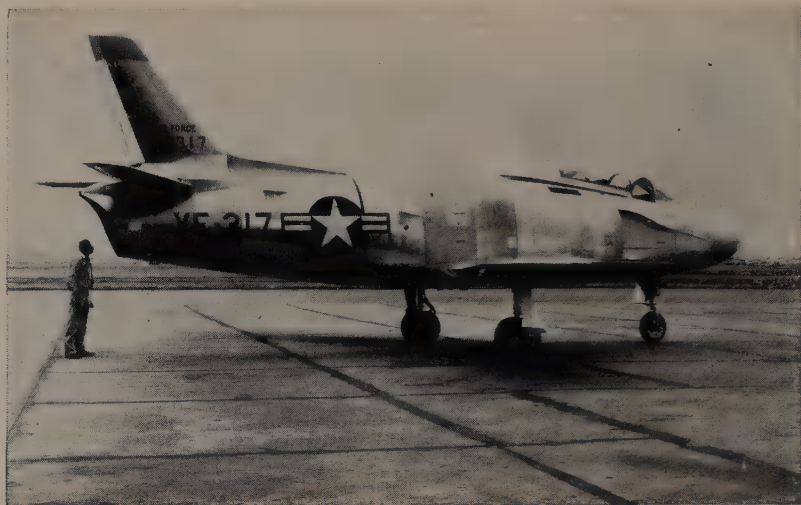
GUIDED MISSILES: Radar-guided "Bat," carried under the wing of a Navy Privateer (above), used against Japanese shipping in World War II. Radio-controlled, jet-powered, pilotless aircraft flying near the speed of sound (center). The "WAC Corporal," test rocket fired to a record height by the Army in 1949 (below).



*Dept. of Defense photo*



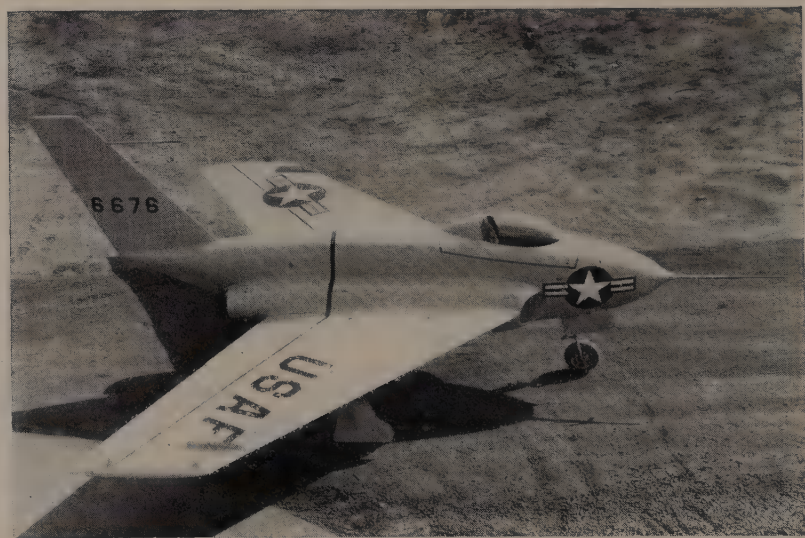
*U.S. Army photo*



*U.S. Air Force photo*

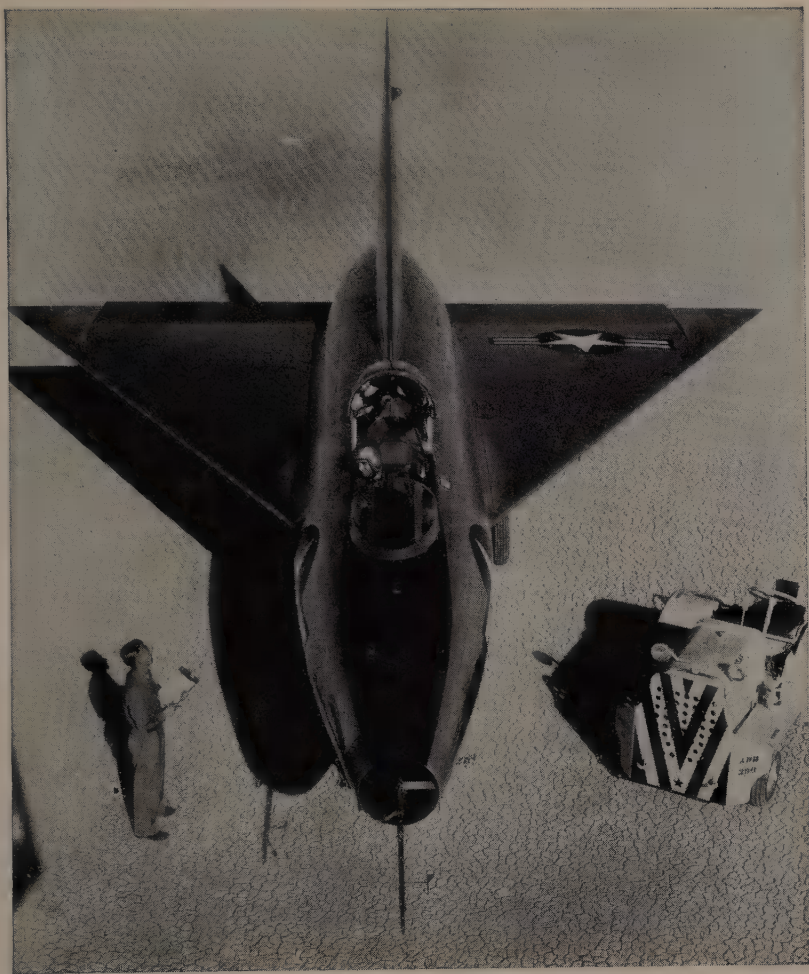
North American YF-93A, one of the latest operational American jet fighters.

Northrop X-4, one of the smallest Air Force jet planes.



*U.S. Air Force photo*

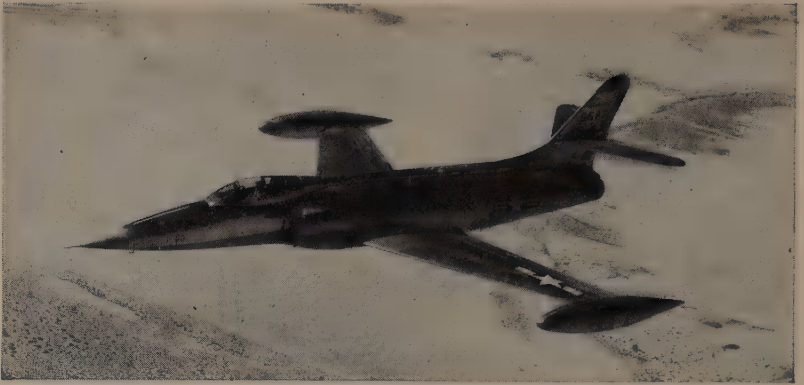




*National Military Establishment photo*

Consolidated Vultee 7002, a jet fighter with triangular Delta wings.





*U.S. Air Force photo*

**JET PENETRATION FIGHTER:** The Air Force's needle-nosed Lockheed XF-90, designed to operate deep within enemy territory. Like the British Mosquito in the last war, it is a weapon of opportunity.

**JET BOMBER:** Boeing B-47 taking off with the aid of JATO rocket assisters.



*U.S. Air Force photo*

nation of airmen, with all that this implies as a reservoir of personnel and skills.

Before the last war, the United States had only 366 planes, with about 1,587 pilots, in its commercial airlines—but 28,000 planes and nearly 100,000 pilots in unscheduled and private flying. This was the pool on which we were able to draw for every kind of aviational talent—flying, instruction, maintenance—to expand our air forces swiftly. Today the worldwide American commercial fleets seem formidable. But actually they include only 1,095 aircraft and some 7,762 pilots. As against this, unscheduled and private flying account for nearly 100,000 planes and 500,000 pilots, and their number is growing daily.

The airlines are exceedingly valuable as potential military transport. Yet it is private flying which forms the principal reservoir of aeronautical strength. The government, it seems to me, should do all it can to stimulate and facilitate the personal use of aircraft. Private flying clubs ought to be encouraged; for instance, by gifts of aircraft and fuel. Civil air patrols should be expanded.

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WE DO NOT NEED a crystal ball to visualize the unfoldment of intercontinental warfare in the air. Given aeronautical knowledge, given combat and flying experience and an understanding of the immutable principles of war-making, one can foresee the nature of the coming conflict with substantial accuracy. Weapons and tactics can be perfected in advance with full assurance that they will be realistic. There will be no shortcuts to victory. Major military successes without brutal combat will be as rare as in the past.

The world will witness another large-scale, costly, desperate struggle. But this time it will be fought in the air and fought between two hemispheres, with each contender operating directly from his heartland. Now, as in the past, the war will drive to its climax in one decisive battle. That clinching battle used to be fought on land, then at sea; hereafter it will take place in the skies.

In the last century, when guns were first put on frigates, artillery was used only to impair the mobility of the enemy ship, by destroying its mast and sails—turning it into a helpless derelict. Then the dis-

abled ship had to be boarded and often the final decision was scored in hand-to-hand combat on the decks of the vessel.

Then the range and power of guns were extended. Though armor and other defensive features were added, the decision was increasingly determined by superior firepower. Ships were disposed of by sinking or the threat of imminent sinking. If they were not sunk, it was because crews surrendered short of that point and invited the victor to board and take control.

The same thing has happened, at a faster pace, in aerial warfare. As long as air power lacked the reach and the firepower to "sink" the enemy nation, it could only soften it for hand-to-hand surface combat that decided the issue. That was essentially the condition in World War I.

In World War II, in its European phase, the application of air power was not carried to its logical limits. The overall plan of war was not so conceived. Having disabled Germany—like the derelict frigate of our analogy—we still had to pass through a final stage of hand-to-hand tussle for possession.

But in the Pacific phase, after an old-style prelude, air power was put into a position where it could "sink" the enemy country. Short of that ultimate catastrophe, the Mikado and his crew invited us to "board" the helpless national ship and take over.

In any coming war, the artillery of air power in the form of improved aircraft, improved bombs, and guided missiles will be able to disarm the enemy without coming into physical contact, without "boarding" it for hand-to-hand surface combat. Whether the victor takes over the helpless hull and makes it seaworthy again will be more of a political than a military decision. The enemy nation will have been defeated before it becomes necessary—or, for that matter, possible—to possess and police the defeated area. With the skies open to unmolested cruising by our air forces, military resistance will no longer be in question.

Whether physical occupation should be undertaken at all will then be dictated by considerations of political wisdom, humane principles, reconstruction, hygiene, the normalization of life. It is not generally understood that the occupation of defeated countries, as the last war drew to a close, had more to do with political than military impera-

tives. Italy after its defeat was still needed as a base of operations. But Germany and then Japan, having been canceled out as military entities, might have been left to their fate. Sentiments of humanity, of course, precluded any such policy. More important in shaping up the occupation, however, was the intense ideological competition among the victors.

The winning side comprised both democratic and totalitarian nations, each naturally anxious that its own basic way of life prevail in the conquered countries. The principal reason for Soviet occupation was to impose its own philosophy and system on the affected areas and to head off occupation by the Anglo-American bloc. The most pressing reason for American occupation of Japan, for Anglo-Franco-American occupation of Germany, was to prevent the "power vacuum" from being filled by the Communists. Consciously on the part of the Soviet leaders, unconsciously and confusedly on our part, two ideologies were squaring off for a new world balance.

In any World War III, the political lines will be clearly drawn from the start. In sober fact, they are sharp enough in the present cold-war stage. Whatever the verdict, there will be only one victorious ideology; there will be no political competitor militarily strong enough to inundate the defeated areas.

Occupation under those circumstances will lose its former military urgency. It is likely to be the kind of occupation that can be put into effect by small compact surface forces, moving in under the absolute protection of friendly skies. These forces will be followed by the Red Cross, relief organizations, and representatives of the triumphant politico-economic system. The likelihood, indeed, is that it will be an occupation by invitation on the recent Japanese model.

But no matter how it is started, no matter how much time and blood and substance is squandered in indecisive sparring, the war of the future will resolve into a finish fight for mastery of the entire air space. While it is under way, surface forces can do little if anything to help or hinder the crucial decision in the skies.

Common sense therefore demands that we channel our main resources and intellectual energies into invincible air power of inter-hemispheric dimensions. As I have repeatedly underlined, we cannot

achieve this while maintaining land and sea forces on the traditional scale. Secondary and irrelevant weapons and forces must be held to realistic minimum, while the requisite air force-in-being is given the magnitude for all-out combat and all-out victory.

Let us not be diverted from the main tasks of aerial preparedness by outcries about defensive ascendancy or offensive doom.



## ON REARMING EUROPE

## 1

AS A MOBILE STRIKING FORCE, air power has reached its full maturity. By its own action it can destroy an enemy's capacity to wage war. It can impose defeat and surrender by direct operations across any body of water. In this respect it has attained an autonomy similar to that exercised by sea power before the advent of modern aviation.

But in another vital respect it remains definitely limited. Sea power can transport men and equipment across oceans to support land operations on a strategic scale; aviation still lacks the airlift for this purpose. Where major warfare *on land* is involved, overseas transport remains a naval function.

Of course, that function cannot be carried out by navies under hostile skies. It must be postponed until the opposing air force is neutralized and control of the skies taken over, a condition which in turn makes land warfare unnecessary. The naval function is therefore unlikely to be brought into play on a large strategic scale. But the fact remains that air power does not have the lift to deliver and supply major surface forces from one continent to another.\*

The spectacular Berlin airlift, remarkable as it was, should not nourish wishful thinking in this regard. On the best day the combined American-British lift amounted to 12,941 tons—in unmolested air across a distance of 250 miles. But the support of our divisions in the field on a scale adequate to meet Russian divisions would require the transport of from 150,000 to 200,000 tons a day—under combat condi-

\* To preclude confusion, let me repeat that air transport in support of aerial warfare—as a vital component of air forces—is quite another matter. Obviously air strategy should not at any stage be tied to and dependent upon limited surface speeds.

tions across distances of 4,000 miles—over and above the initial millions of tons involved in bringing those divisions and their accoutrement into the field. The Swarmer Operation maneuvers (North Carolina, 1950) showed that to move a single corps and its supplies called for an airlift greater than that represented by the equipment of our entire domestic and foreign airlines system. Far-reaching advances in aerodynamics, fuels, and propulsion will have to be registered before the limitation of air power in this connection is removed.

Possibly the use of atomic energy for propulsion will solve the problem ultimately. But it cannot be expected in less than twenty to thirty years on the most optimistic reckoning. With reference to the immediate emergency it can therefore be discounted. The delivery and supply of, let us say, two to three hundred combat divisions across oceans through the air is out of the question. Even if it were possible, the potential it would tie up in a titanic air-transport armada, if put into combat air force, could defeat an enemy more swiftly, more economically, and with less expenditure of life.

Significant consequences flow from this limitation on air power:

1. A great *land force-in-being*, with its own supporting tactical air arm, cannot be prevented from taking possession of its own continent except by superior land force already in existence on the same continent.

2. On the other hand, a preponderant *strategic air force-in-being* of one continent can neutralize and liquidate a land force of another continent by assuming control of the air and destroying its means of waging war.

Thus the airlift limitations would not actually serve to decrease the predominant position of air power—if the war is fought, as any future war will have to be fought, in terms of overall air-power strategy. Indeed, the *transport* limitations of air power serve only to emphasize the importance of its *combat* phase. There being no way in which land forces can be transported to another continent without first attaining control of the air, the land forces of a self-sustaining Great Power can be neutralized and defeated only by strategic Air Force.

The illusion that land force on a decisive scale can still be transported across oceans by naval power underlies the demand for universal military service in our country. Those who seek to generate

gigantic American armies think of them as a counterweight to Soviet Russia's immense land strength. Encouraged by the success of the European invasion in the last war, they are content to stake their hopes on another and bigger invasion.

They forget that conditions have changed fundamentally. In the last war, aircraft were still of limited range. Our factories were unmolested. Great expanses of ocean were wide open to us. Because Hitler did not have long-range aerial striking force, because it was still possible to provide a carrier-based umbrella of air protection over naval transportation, we could amass large armies in England without serious interference. Despite this, the invasion required years of preparation and then was withheld until the enemy's land vitality had been sapped and his air strength virtually destroyed.

Today American factories would be under aerial bombardment, as would points of embarkation in the U.S.A. and disembarkation in Europe. Harbors, as the Bikini tests showed, would be especially vulnerable to atomic attack and could be kept neutralized. No isolated stretch of ocean could be protected against hostile air action; the enemy will be able to concentrate thousands of airplanes against any ocean lane, against any naval transport armada. Air-over-ocean will be as much a part of the theater of air operations as air-over-land. Under these conditions naval fighting forces themselves cannot survive, let alone transport millions of men and their complement of equipment and supplies.

LET US APPLY these considerations to the situation on the European land mass.

Nothing is gained by deluding ourselves about the self-evident facts. Soviet Russia today holds physical dominance of Europe. If the Red Army, spearheaded by its tactical aviation, were set rolling westward, there is no military force in existence to stop its progress to the brink of the Atlantic. Only another great land force could halt or turn back the Red tide, and that force is not in existence. Talk of containing the Soviet land colossus on the Elbe or the Rhine, even if the proposed forty-five West European divisions were available, is unrealistic. Stalin cannot be blocked where Hitler crashed through.

The hope that it can be accomplished has been vigorously propagated recently. Secretary of State Acheson, for instance, told Congress that an effective land defense can be developed without creating "huge standing armies." The extreme difference in numerical strength, according to this theory, can be made up by American technical superiority, expressed in newly forged weapons. Equipped with atom-loaded shells, shaped charges, guided missiles, bazookas, land mines, new recoilless artillery, and other superior weapons, a relative handful of troops can hold the Soviet mass army at bay.

That hope rests on a mirage—the mirage of a Chinese wall of wonder weapons. This seems to me a highly dangerous and self-deluding gamble. Certainly it does not pass the test of recent war experience. Hitler, too, thought he could stymie the Allied air offensive despite its overwhelming numbers by employing wonder weapons like jet and rocket fighter planes, guided missiles, buzz bombs, and V-2 rockets. He was mistaken. Our conventional aircraft, though ten years old in design, swamped his "fantastic" novelties.

Why? Because our air strategy was right and his was not. Hitler misused his nation's talents, resources, and productive capacity for strategy that was essentially defensive. He chained scores of thousands of his men and his best underground facilities to the manufacture of the touted "secret weapons." Had the Germans used those potentials to provide conventional fighter aircraft—to defend their own air and also (by using droppable extra fuel tanks) to strike offensively at our air force clustered on British bases—they would have had more chance. Our strategic air concept, by contrast, was correct and by the end of the war our airmen were given a free hand to exploit it. We accumulated a superior mass in the decisive medium in the right time.

The same principle applies to warfare on land and at sea. The surprise of wonder weapons may win isolated battles—but not wars. The overwhelming quantity of Russian land force is in itself a quality. That mass will be set in motion as soon as a counterforce of challenging proportions on its continent begins to emerge—regardless of whether that challenge is in the form of superior weapons or growing numbers. Our Army leaders themselves, furthermore, have pointed out that Russia's trump card is superiority in tanks and artillery. It

would be reckless to proceed on the supposition that the Soviets—already engaged in expanding the use of atomic explosives—will not make their greatest strides in the very technological field in which they excel. They, too, may bring into play “secret” weapons to match and neutralize our surprise weapons—and perhaps much sooner than expected. Let’s recall that in the last war Russia was years ahead of us in the use of rocket artillery.

New weapons of decisive value are normally protected with the utmost secrecy, to enhance their surprise value. When this rule is broken, when such weapons are prematurely and conspicuously advertised, it is a tip-off of strategic frustration. Intended to reassure ourselves and impress the enemy, it is more likely to comfort the enemy by indicating a confused and desperate military state of affairs.

Throughout this book I have stressed American technological superiority. But I cannot emphasize too strongly that this immense advantage will pay dividends in victory only *when the basic strategy is right*—when we channel our scientific superiority in adequate quantity into a superior force operating in the decisive medium, and that today is the air.

The tidal wave of Soviet force could be dammed, and that only temporarily, by the Pyrenees, saving Spain for a while from the all-European fate. The terrain is difficult for large armies and motorized forces. But unless American strategic action against the U.S.S.R. proper turns the scales, Spain too would succumb in the end. The Pyrenees can serve as a land block in the same sense that the English Channel serves as a water barrier. The Iberian peninsula might conceivably be held as an accessory base, not for major strategic operations but for initial attack. Possessing a certain amount of industrial vitality and manpower, Spain certainly makes a more hopeful base than some of the “African oases” being shaped into strategic offensive bases. Whether it could continue to be used after the initial stage would depend, of course, on who holds control of the air over the rest of the European continent.

In the Near East, the Dardanelles and the Suez have lost their former military importance. The hot jurisdictional disputes over control of these passages are, from the military angle in our times, meaningless. Whoever holds the air above will dictate their use below.



An American decision to rearm Europe on a scale commensurate with the Soviet threat, however lavishly it might be backed by our Treasury, cannot remove the melancholy fact of Soviet superiority on land. It is usually forgotten, in the polemics on the issue, that dollars cannot cancel out *the time element*. No matter how generous the financing, the process of rearmament would take at least five to ten years. In this time interval the Soviets would continue to hold their dominant position, deterred, if at all, only by effective power outside their continent.

The creation of a force in Europe capable of meeting an all-out Red land offensive would require not only the training and equipment of at least three hundred divisions, not only the construction of a great supporting tactical air force, but the restoration of the industrial basis on which an effective military machine must rest. It would also require—and that may well prove the slowest part of the aggregate job—the moral reconditioning of the European people for combat and resistance.

While this vast undertaking is under way, what would the Kremlin be doing? Those who discuss the revival of West European military vitality shy away from the distressing question. Certainly it is asking too much to assume that Soviet Russia will watch passively while a balance of military power, involving the end of its dreams of Eurasian empire, is being built.

We must face the fact that Moscow has and will continue to have the physical capacity to interrupt and smash West European rearmament at any stage before its completion. To preserve its clear predominance on the Eurasian continent—the very essence and condition of its new strength—it must attack and destroy any force that rises as a challenger on that land mass.

Whether under the spur of aggressive ambitions or compulsive fears, the U.S.S.R. may be expected to strike before the massive rearmament program jells. The temptation to do so, indeed, would increase as mountains of equipment, new air bases, radar networks, and revived industries pile up in Western Europe, providing ever more valuable booty to a conqueror. The logical moment of attack, in fact, can be roughly estimated. It would be the stage at which prepared-

ness is advanced enough to be worth capturing but not yet strong enough to offer decisive resistance.

That is the elementary logic of the picture. Yet I do not offer it as a firm prediction, knowing that logic does not always rule the minds of nations. It should be recalled that on several occasions appraisals of the enemy's probable "next step" in the last war were mistaken precisely because the obvious logic did not prevail.

When the Germans took the island of Crete, I expected them to follow up with attacks on Suez and Gibraltar from the air. At the time nothing could have stopped them. Instead Hitler chose to attack Russia without first making the Mediterranean secure. In his interrogation, Göring was particularly bitter on this score; he had been ready, he assured us, to "lock Gibraltar and Suez" when his boss moved to Russia. Similarly in the Pacific: having wrecked Pearl Harbor, Japan could have occupied Hawaii, then moved against our undefended West Coast to demolish the major portion of the American aviation industry, including the sources of all our bombing aircraft. Why it did not exploit its advantage defies logical explanation.

We can only note when it would be logical for the Russians to move against European rearmament. Beyond that point, the moral rehabilitation of Western Europe, its enhanced economic and political stability, will make it a more formidable foe. The healthier the democratic segment of the continent becomes, the harder Soviet Russia will find it to digest its conquest after taking military possession.

Intervention before Western Europe becomes a self-sustained military entity must therefore be accepted as a strong likelihood—unless it is headed off by a counterforce *on another continent*.

IN THE INTERESTS of world peace, the United States should help restore the military potential of Western Europe. On this long-term objective there seem to me no reasonable grounds for disagreement.

Any hope of an economically healthy and morally self-reliant Europe is precluded as long as the nations this side of the Iron Curtain live under the continuous menace of Soviet conquest, by aggressions

from without or from within. Peace will remain tentative at best until a military balance of power is established on the European continent and its democratic countries cease to be military wards of America.

There are those who argue that the search for that balance, implying an arms race, may lead to war. That risk cannot be denied, but neither can it be evaded. The alternative to balanced power is unbalanced power; of the two evils, we must choose the lesser: the revitalization of West Europe militarily to the point where its potential begins to approach Russia's.

The *ultimate* creation of such a balance is possible. Given economic rehabilitation and social stability, Western Europe in time should be able to muster the manpower and the resources for effective self-defense. *That long-range objective must not, however, be confused with immediate possibilities.*

This does not mean that an early start in the military revival is not desirable or feasible. If nothing else, policing strength in the democratic nations demands it, in an era when armed Communist minorities, at the instance of foreign associates, may make a bid for power. But the effort would be futile and self-defeating unless insured by adequate force, and force of the right kind, on the American continent.

It is generally assumed that the Kremlin has been restrained thus far (political considerations aside) by fear of touching off a war to the finish with the United States. It seems apparent that the Soviet Union is not yet fully geared for such a showdown. Certainly the only factor that can be safely counted upon as a brake on Moscow in the immediate future is the prospect of deadly American retaliation. That truth underlies the North Atlantic Pact, which amounts to an explicit warning that a Russian assault on any of its members will be regarded as aggression against all, the United States included.

*Superior American air power is the sword of Damocles hanging over the head of Soviet Russia.* Any policy, any serious diversion of funds, which hampers the forging of that sword or tends to blunt its cutting edges must be ruled out—especially in the interests of the security of Western Europe. *The indispensable condition for European rearmament is the existence of a force capable of shielding the undertaking.* And only adequate American air force "in being" provides the guarantee that the hoped-for rebirth of European capacity

for self-defense will not be nipped in the bud. It is the sole force that can discourage a would-be aggressor from attacking or, in the worst case, compel him to loosen his grip on the continent.

But this retaliatory force must be on another continent. If based on Europe or its environs, it would merely serve as an additional invitation to Soviet attack, and it would have to share the fate of Europe should the attack prove successful. It would lose the very element which constitutes its advantage and its deterrent power: operation from bases beyond the orbit of the enemy's combined land and supporting air strength.

Air power is no more effective than its bases. Once those bases are eliminated, the aviation becomes paralyzed. If obliged, by reason of insufficient range, to strike from Western Europe, our air power will be as vulnerable as any other military objectives on that land mass. It will be subject to defeat through seizure or demolition of its bases. Instead of protecting Western Europe, it will be in the same boat with Western Europe.

Our strategic air force, to put the idea in another way, acts as a sword of Damocles only when it is in the hands of someone beyond Russia's reach, on another continent.

Our long-range strategic air force, moreover, cannot be used effectively directly against the Soviet land strength. Strategic bombers are not a proper weapon against armies in the field supported by tactical aviation. If used for that purpose, they are simply reduced to tactical aviation and, since they have not been built or geared for such functions, are uneconomical and inefficient.

Strategic air action has to be directed against the source and center of the enemy war-making potential. And that will not affect armies-in-being in the field—until they exhaust their reserve weapons and supplies. In Europe, to be specific, this time interval would be more than enough to allow the Red Army to roll over the entire continent. Atomic explosives do not change this picture, for the atom bomb, as has already been noted, also is not a proper weapon against advancing ground troops.

A Red Army drive to the Atlantic could be halted only by a counterbalancing land force. It would be impossible to generate this in Europe or provide it on a decisive scale from the American side of the

Atlantic in the next five or ten years. Like it or not, there remains no alternative to strategic air force operating from the American mainland.

The conclusion is inescapable. Invincible American strategic air force, based in part on the British Isles (our only tenable overseas base) but for the most part on the American continent, must have number one priority in planning the economic revival and military security of Europe. It is the precondition for the rearmament of the democratic portion of that land mass. Moreover, that rearmament presupposes the continuing safety of its arsenal: the American continent. Since Soviet Russia has long-range air forces and atomic missiles, the vast air force for defense of the American mainland must take precedence over European needs—even from the point of view of Europe itself.

To store perishable goods, the first and minimal need is a stout and impenetrable roof. Rearmament of Western Europe, until it is brought to the point where it balances the terrific Russian surface might, will remain exceedingly perishable goods.

That roof, moreover, cannot rest on pillars in the European soil, where they can be chewed up by Red termites. It must therefore be in the form of a cantilever canopy anchored on the American continent, not subject to undermining by termites on the other side of the ocean. Which is another way of saying American air power independent of European bases and geared for instant attack on Russian industries, communications, and other means of waging war.

Under the security of such an air-power canopy, democratic Europe can begin to reorganize its military potential. The fighting manpower will be drawn from its own large population, while America at the start makes available the major portion of the equipment and industrial tools. But we should not deceive ourselves that a few billion American dollars can rearm Europe to make it a match for the Soviets. It is unfortunate, in my view, that the limited American funds are tagged for "rearmament." Our few billions can only prime the pump of European self-rearmament; it can merely provide the initial momentum in a process which must be carried forward by Europe itself.

To transform Europe into a military entity really capable of resisting Soviet might, at least one hundred and fifty billion dollars would



be required. The American people should not allow themselves to be misled on this central reality. Otherwise they may be sucked into an undertaking so prodigious that it would leave their own country virtually defenseless. Otherwise they may be launched on a road from which there will be no return—as they will be told too late by those responsible for the self-defeating commitment. We do not have enough productive capacity to industrialize and rearm Europe and at the same time create both adequate air force for defense of our continent and invincible, long-range striking air force for victory.

In pressing Congress for an initial appropriation of 1.2 billion dollars toward rearming Western Europe, the White House and the State Department stressed the intention of blocking Russian aggression. The idea, they argued, was to put teeth into the Atlantic Pact, to make it a strong deterrent.

The effect, however, could be quite the opposite if the first installments of military aid were regarded as beginning the development of a beachhead for *American* surface action or as attesting a decision to stake everything on land warfare in Europe. Were Moscow convinced that we plan to siphon off our major national resources and manpower for such purposes—that we visualize a bigger and better Normandy operation—it certainly would not be deterred. On the contrary, insofar as the United States seemed committed to an old-style surface struggle—which would mean a war fought on Russian terms—Moscow would be emboldened in its aggressive designs.

Our policy should leave no room for doubt in the Soviet mind that military aid to Europe—or Asia, for that matter—will not substantially reduce or impair America's main objective: the ability to destroy Russia's war-making setup by direct strategic air action. That, and that only, will provide a sufficient deterrent.

Its deterrent power, let me re-emphasize, will lie not only in the threat of large-scale destruction of life and property but in the threat to the prestige of the dictatorship at home. What the Soviet rulers fear most, I believe, is the ability of American air power to dispel from the outset the myth of their military invincibility. If the confidence of the Russian people in Stalin's military genius is shaken, the regime may face an explosion of the pent-up hatreds of its subjects.

In the face of overwhelming American air force of interhemispheric range, the Kremlin may hesitate to provoke a hot war that will be hottest immediately in its own country. No victories in Western Europe or elsewhere could offset impressive defeats *from the start* inside the Soviet Union. Our air power, therefore, is the best deterrent—not to the people of Russia but to their rulers, whose authority will be menaced.

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THE LIKELIHOOD of a Soviet occupation of Europe in the event of war is of course distressing. That is one reason why peace rather than war is our objective; why we plan, in the first place, to deter aggressors, even while getting ready to win if they should refuse to be deterred.

Emphasis on the sad truth of Russian capacity to take over Europe can scarcely be popular with Europeans. The prospect of their countries being turned once more into battlefields is disheartening. But evading the facts, to the extent that it fosters illusions, is a dangerous business.

Nevertheless, the *long-run* pessimism expressed by some military writers on this matter seems to me wholly unjustified. What will it avail us, they ask in substance, to knock out the Soviet giant on his home grounds, when his armies are in occupation of all Europe? Will we proceed to bomb the European industrial and population centers to drive out the invaders, thus destroying the very thing we would safeguard?

Our experience in Japan, I am convinced, has given us the answers to such questions. In my previous book, writing at the time of Japan's greatest victories, I compared that nation to "a great octopus. . . . Its body and its vital organs are in the Nipponese islands proper. Its tentacles stretch across thousands of miles—into China, Malaya, the Indies, the Philippines, Guam, Wake. Others are reaching out toward Australia and New Zealand. If we were able to strike at the heart of this sprawling beast, at Japan itself, and knock it out there, all the tentacles would instantly fall limp. They would relax their grip on victims. . . ."

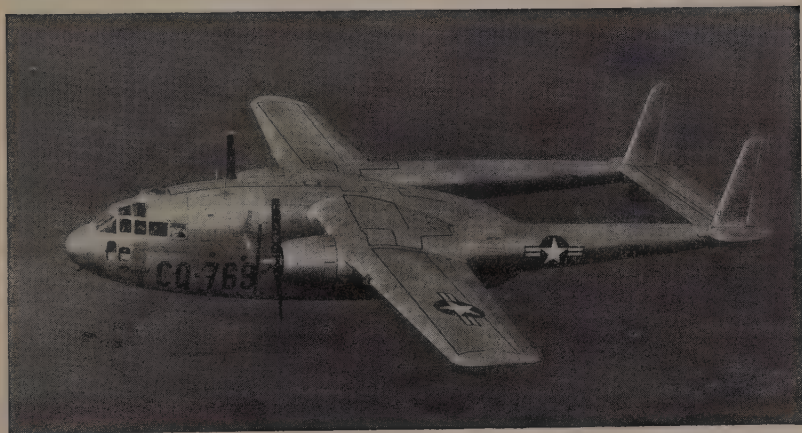
The truth of this image was in due time demonstrated, although its implications have not yet been fully digested. When at last we were



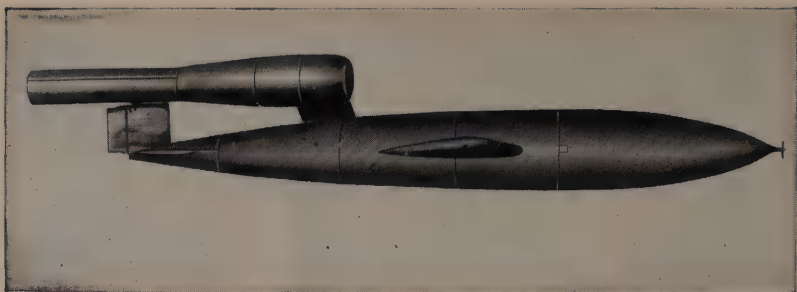
*Dept. of Defense photo*

**FALLACIOUS PROCEDURE:** A light tank being unloaded from a C-124-A cargo plane, on arriving at the combat area in maneuvers, "Exercise Swarmer." As a bomber, the same plane, carrying an A-bomb, could destroy an entire industrial complex; or, with TNT, could destroy a plant manufacturing thousands of such tanks. But chained to surface forces as a transport, it can deliver only the insignificant firepower represented by one tank gun.

**AIR TRANSPORT:** While transport planes (such as this Fairchild Packet, C-119-A) cannot hope to provide sufficient overseas "air-lift" to support *surface* strategy, they are a vital factor in air strategy. The tempo of aerial warfare should not be tied to slow-moving surface transportation.

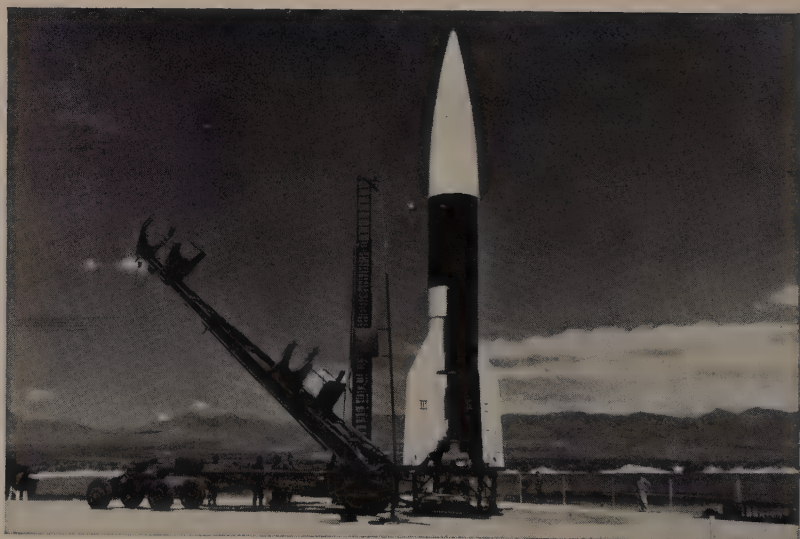


*U.S. Air Force photo*



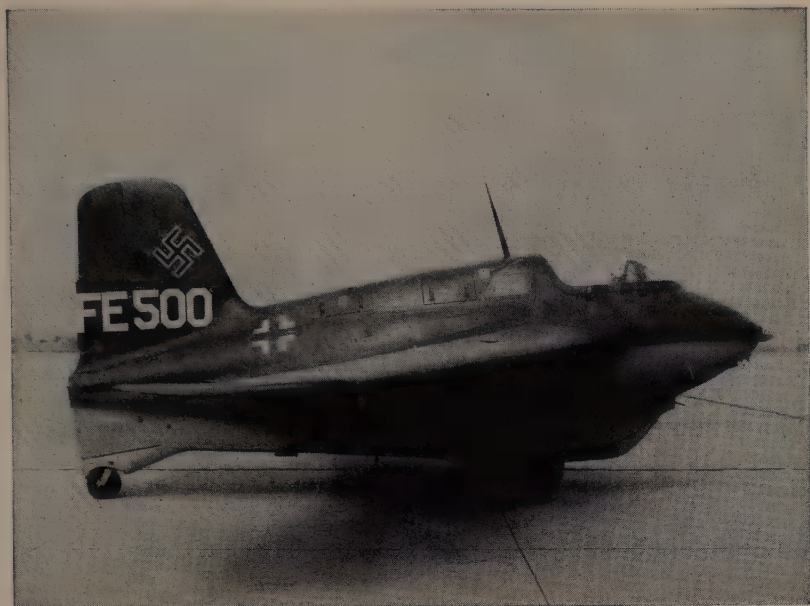
*International News photo*

WONDER WEAPONS: Faced by overwhelming Allied strategic air power, Hitler turned to "secret weapons": the V-1 buzz bomb (above); the V-2 rocket (below); the rocket-driven interceptor fighter, ME-163 (above, right); and the ME-262 jet fighter (below, right). These remarkable products of German science have since become part of the arsenal of modern warfare, but they did not turn the tide for Germany. The surprise appearance of "wonder weapons" may win isolated battles, but they cannot win a war for a nation whose over-all strategy is wrong.



*U.S. Air Force photo*





*U.S. Air Force photo*

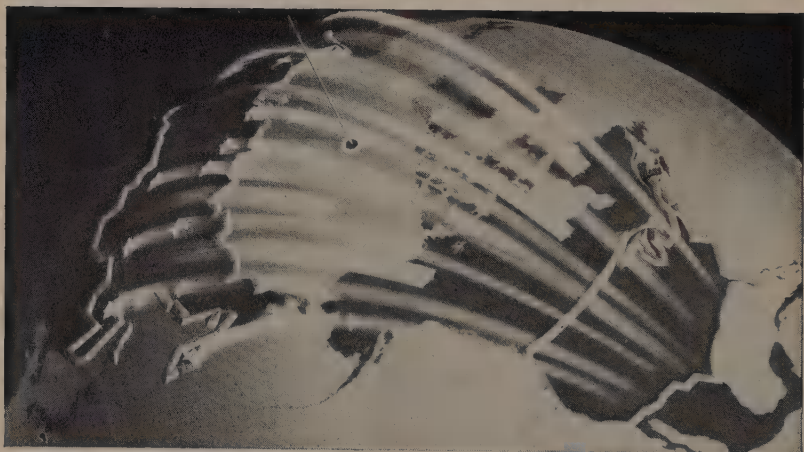






**"STEPPING-STONE" VS. DIRECT AIR OFFENSIVE:** In the last war, air range was arbitrarily restricted by planners who did not comprehend the strategic possibilities of air power. Our air forces therefore had to be planted on overseas "stepping-stone" bases before they could strike at enemy vitals. We had to win a Battle of the Atlantic before winning the air battle.

Today, with interhemispheric range a reality, an air offensive can be undertaken directly from our continent, with an immense saving in national effort. Nevertheless, orthodox planners seek again to commit us to the outlived and profligate stepping-stone strategy. With deadly schnorkel submarines, and with our shipping being attacked by the enemy's long-range Air Force, such overseas bases would be stranded and gobbled up one by one, just as we did to Japan.



*Both reprinted by courtesy of Look Magazine; from the author's article, We're Preparing for the Wrong War, December 9, 1947.*

able to strike effectively at the Japanese heart, the tentacles of the octopus did fall limp.

No less can be expected in a Red-occupied Europe when the Soviet regime has been mortally wounded in Russia itself. To maintain the morale of Stalin's forces occupying foreign areas since the end of World War II, commanders have been obliged to isolate their troops from the local population. Despite efforts to shield them constantly against the infection of Western ideas and the temptations of Western living standards, desertions have been continuous and often epidemic, not only among the soldiers but among their officers, up to commanding generals.

Moscow has considered it expedient not to keep divisions outside the Soviet frontiers too long. It has felt it necessary to screen returning forces carefully before allowing them to mingle with the citizenry at home. This is true even when the foreign areas are under imposed Communist regimes; the superior physical heritage left by capitalist civilization is still on view.

If this is true under conditions of victory, when the Soviet government is enthroned in the Kremlin and disposes of incalculable repressive machinery, the chances are remote that the Red occupation forces would remain disciplined and obedient to a regime beaten and humiliated and unable to enforce its will. It does not call for a prophet to foretell that once strategic air power has smashed the Soviet war-making potential inside Russia, the Red forces abroad will fall apart and their military power will melt away.

I can contribute some testimony from personal experience. I happened to be in command of Russian fighter aviation in the Baltic when the revolution of 1917 took place. The specialized men in my outfit were well above the average in mental caliber. Yet when they realized that their country was in the throes of dissolution, they thought only of their loved ones caught in the maelstrom of violence, their unprotected wives and parents and children. And they headed for home.

The same thing happened, on an overwhelming scale, on the entire Russian front. Once the government was defeated in the homeland (in this instance by internal forces), the Russian armies lost their cohesion and became little more than a disorganized mob.

The fear that Red armies deployed through Europe might continue in occupation after their home government is defeated—that they might have to be dislodged by bombing—is utterly unfounded. They would quickly be reduced to an impotent mass of displaced persons, eager to get home to their families and their personal interests.

But if, instead of striking at the heart of the octopus, we should insist on untangling every separate tentacle—"liberating" friendly areas in an inch-by-inch struggle—those areas would be thoroughly ravaged in the grueling process.

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ALTHOUGH RESTORATION of West European military strength, with the French Army as its core, is an ultimate goal in order to restore an ultimate European power balance, it must at this stage remain subsidiary, both in the matter of national investment and priority on resources. The right of way must be left open to American air power.

There are some who visualize a grand coalition of all the countries west of the Iron Curtain to match the Soviet potential division for division. Most of those divisions are to be provided by Europe, though largely equipped by America. The rest will be trained on our side of the ocean and, when war starts, conveyed to Europe by an immense navy under its own umbrella of air power.

All of which, as the reader by now realizes, is pure fantasy. America is not rich enough in men and materials to translate that ambitious concept into reality—and at the same time develop the strategic air power which alone could restrain Soviet Russia from rudely interrupting the whole enterprise. First things must be put first in planning for world security. We simply cannot afford to build anything and everything that is proposed without going bankrupt, and dissipating our strength.

We are already launched on an incredibly profligate strategy, almost suicidal in its waste of our substance on superfluous weapons. It is draining American national resources at an alarming rate. To add to this the burden of massive European rearmament could only spread our limited strength still more thinly. In theory we would be attempting to revitalize European self-defense; in actuality we would be making that very thing impossible. Europeans who urge that procedure

are either talking nonsense for reasons of political expediency, or they have not succeeded in thinking the problem through.

An intelligent French military man wrote to me recently in a vein that seems typical. An inferior West European land force, he argued, if supported by large-scale tactical aviation, could "hold" the Red Army on some entrenched line, such as the Rhine. It could not sustain an offensive, he implies, but it would dam the Soviet tide indefinitely.

If that idea is widely held in France, it is sad proof that the country has not yet outlived its Maginot Line delusions. For it is still a purely *defensive* idea, resting on the assumptions of *static* warfare. The line now would be extended upward into the heavens, the concrete wall replaced by an electronic wall of radar, its guns replaced by tactical planes. But it must prove as tragically disappointing as the original Maginot Line. The notion of providing enough tactical aviation to match and outmatch Russia's—enough to compensate for the disproportion in foot soldiers and tanks and artillery—is utterly unrealistic. A strategic policy requiring that much tactical air force belongs in the never-never land of military make-believe.

Any attempt to stem the Red Army's progress would instantly resolve into a contest in the skies for air control between the opposing aerial contingents. While engaged in fighting the Soviet aviation and protecting its own bases, the Western tactical air force would be decisively handicapped as a supporting element for the armies. We must emphasize again that tactical aviation is not an independent force and can never in itself score a decision. It is the spearhead of an army, a flying artillery, and effective only in the measure that its action can be immediately exploited by ground troops. If there is no army for follow-up purposes, or if the army is too weak, the tactical air action becomes as futile as field artillery wheeled into battle without infantry follow-up.\*

Military observers of the last war have noted the triumphs of German armies spearheaded by tactical air power, then the rapid progress

\* The initial picture in Korea bore out this principle. We limited ourselves at the start to giving support and cover to South Korean ground forces so weak that they were virtually non-existent. Our tactical air advantages therefore proved useless. We were quickly obliged to shift to assault against the bases, supply depots, and communications above the 38th Parallel, in North Korea, and to attempt to provide troops for the exploitation of tactical air action.



of the Anglo-American forces spearheaded by their tactical arm. They overlook a vital factor. Hitler's armies fought against French and Polish troops virtually unprotected in the air. The invading Anglo-American armies faced German opposition that had been virtually stripped of its aerial component by our strategic air action prior to the invasion.

It should not be forgotten that in defeating the main German ground forces, our commanding generals never had to fight under hostile skies. Their tactical air force was really a luxury, supplementing the artillery. In this connection, I recall a typical comment by General Patton, whom I met for the first time at a reception in the American Embassy in Paris after V-E Day. I approached him with the intention of introducing myself. But when I was within ten paces, Patton pointed his finger at me and exclaimed:

"I believe only fifty per cent of what you're going to tell me about air power!"

Then he proceeded to lavish praise on the Air Forces. "I never worried about my right flank," he said. "I left that to Vandenberg and his boys. This was the most efficient use of air power I ever saw."

General Hoyt Vandenberg, of course, was in command of the Ninth Air Force, with General O. P. Whelan under him heading up the Nineteenth Tactical Command, which supported the Patton advance. Apparently it had not occurred to this great soldier that the fighting groups composing the Ninth Air Force, together with strategic air forces, had already destroyed the *Luftwaffe* from the British Isles, enabling the tactical aviation to concentrate on ground targets. He was enthusiastic about the fifty per cent he had seen in action, while dismissing lightly the fifty per cent which had fought for three years to make the invasion and the rapid ground advance possible!

Battle between armies that *both* possess effective tactical air components is quite another matter. It would touch off a decisive air battle and a contest in demolition of air bases. While that battle continued, the relative strength of the opposing armies would depend on their own size, strength, and equipment, precisely as in the pre-aviation times. The preponderant Soviet surface force would tell the story. If, as rumored, atom bombs can be made small and light enough to be carried by tactical aircraft, the neutralization of air bases will



become that much easier. With the respective tactical air forces grounded, the contending surface forces would again have to fall back on their own numbers and vitality. In either case, the defensive theory would prove as weak as it did in World War II.

When the American people decide that long-range air power operating from their own mainland is their primary strategic reliance, they will effect true economy in national-defense outlays. They will then have a margin to spare in manpower and wealth for pump-priming a genuine military revival in Western Europe. At the same time that strategy will insure the necessary time for rearming without Soviet interruption.

That sort of rearmament effort will, in addition, tend to divide the Soviet air potential. Knowing that a surface counterforce is in the making, Moscow will be obliged to maintain its own surface force at peak. Consequently a larger portion of the Russian aviation industry will have to be committed to the production of the tactical planes that go with modern land power. The aeronautical resources available for long-range strategic aviation and for air defenses against foreign strategic air power will be correspondingly reduced.

American resources, by contrast, can be focused on strategic aviation, while Europe generates its own tactical aviation—a type of production well within its industrial scope. It is not a question of “abandoning” Europe. In concentrating on strategic aircraft we shall be providing the shielding and retaliatory force without which Western Europe is helpless. At its end, Western Europe, in concentrating on tactical aviation, will be helping America in two ways: it would permit all-out construction of strategic aircraft by our aviation industry, and it would force the Soviets to split their potential by producing both tactical and strategic aircraft.

The problem of rebuilding European defensive vitality cannot be considered in a vacuum. It is inexorably bound up with the whole global equation and must be put into its proper place in the larger picture. A table of priorities in this crucial period of preparedness for peace—and for victory if war is forced upon us—would be roughly as follows:

*First:* Long-range American strategic air force for direct intercontinental warfare.

*Second:* Adequate air force and other defensive means to shield the American continent.

*Third:* Reinforcement of the British Isles as our most important (and only tenable) advance air base—and creation of necessary naval forces for that purpose.

*Fourth:* Rearmament of Western Europe and its industrial rehabilitation to make possible the eventual emergence of independent military strength.

All these objectives must be pushed simultaneously, of course. But in the assignment of money and the allocation of materials, when critical choices must be made, these priorities should be followed. To do otherwise would be to kill the goose that lays the golden eggs of American deterrent and retaliatory power.

It is well that a beginning has been made in the restoration of European military strength. It is a shot in the arm for the morale and self-confidence of the nations involved. It will provide at least the minimum strength for policing purposes—to discourage fifth-column adventures and to defeat them if they take violent forms. It will initiate the long-term program for an ultimate balance of military power on the European land mass.

Meanwhile, the progress in economic well-being and reconstruction made in the democratic sector of Europe with American help also has important military significance. The higher the living standards, the more difficult an invader will find it to digest occupied populations.

There is a widespread suspicion that America is extending aid to Europe and the Asiatic fringes only to protect its own skin—to hire foreigners to fight our war, as some charge. The idea is as false as it is ungenerous. From a cold-blooded standpoint, every billion we now put into Europe or Asia means that a billion less is available for the air strategy of victory. The essence of the military assistance program is not dire strategic necessity but political fellowship: a desire to show solidarity with people threatened by a common foe.

If military logic were the sole motive, America would husband all its resources to guard the Western hemisphere and *guarantee* victory through air power, with liberation of Eurasia from the Soviet octopus to follow. The world should understand that the United States is

knowingly sacrificing a portion of its national potential for reasons of sentiment and political warfare—and is to that extent trimming down its prospect of victory from an absolute certainty to a strong possibility.

From the vantage point of old-style surface strategy, it is true, we would need European bayonets, just as we needed Russian bayonets in the last war. If that strategy fails—as is likely—if Europe's bases and weapons are taken as booty, the consequences would be about the same as in the last war: a further strengthening of the Frankenstein monster.

But with the aerial strategy dictated by present-day conditions, those bayonets can be safely dispensed with. Those who think that in generating and using European soldiery (as implied in the North Atlantic Pact arrangements announced in May, 1950) we are relieving the strain on American manpower are deeply in error. To the contrary, it puts additional burdens on our manpower. Not only does it commit a portion of the American war potential to large-scale European rearmament, but it imposes upon us the problems of gigantic supply lines to keep the European forces operative in war.

The scheme might work only if we were able to amass and equip overwhelming land forces in Europe, along with enough supplies for sustained operations, *before the start of hostilities*. Russia, however, could scarcely be counted upon to accommodate us by standing aside until such colossal preparations are completed.

The scheme of "balanced forces" is no less fallacious when it is applied on an international scale, as outlined by Secretary of State Acheson to Congress on May 31, 1950. It still violates the basic principles of war in general and war in the present air age in particular.

A decision to stake the outcome on surface force, even with Europe contributing the bulk of military manpower, has in it the seeds of disaster. It will mean, in effect, the building of an army that may not have a chance to fight, and sea force that may have no place to which to deliver—at the expense of the one force that could by its own direct action destroy Soviet military might regardless of what happens on the surface.

To some people the statement that we may be expelled from Europe despite proposed "balanced collective forces" will sound as

preposterous as the warning before Pearl Harbor that we would be expelled from the Pacific despite our "invincible" Navy. It happened then, and it may happen again for the same reason. Our strategic concept was wrong then and it is wrong now.

If our objective is peace, as Acheson rightly said, if our aim is to deter Russia, let us ask a simple question: Which will cause the Kremlin more concern—the unloading of obsolete planes, tanks, and guns on the periphery of the Soviet empire, or an unambiguous American decision to build a superior air force of thousands of intercontinental battleplanes and bombers to assure unimpeded command of the air clear around the globe?

It has become a truism in our epoch that foreign policy is only as effective as the military force by which it is buttressed. Once we adopt a simple and logical strategy, one that is safely within our means, our foreign policies will be correspondingly simplified. We shall be able to pursue our goal of world peace with self-assurance and without being misunderstood either by friends or by potential foes.

## THE IMPORTANCE OF SOUTH AMERICA

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FOR ALL its amazing natural riches, the United States is still to a large extent a have-not nation. It depends on the outside world for a long list of strategic materials.

Cobalt, for instance, is a key ingredient in the making of gas turbines, but 75% of our cobalt requirements must be imported. Chrome is indispensable in the manufacture of high-grade steel alloys, but 85% must be brought in from beyond our frontiers. The situation is equally bad in regard to tungsten, manganese, crude rubber, and many other metals and minerals without which a modern war cannot be fought and won.

If we do not insure continuous access to such products *under war conditions*, we may find ourselves dangerously and perhaps fatally handicapped. Think back to our plight at the start of the last war. Our country had counted complacently on a flow of rubber, hemp, a hundred other key materials from the East Indies, the Philippines, Indo-China. Did we not possess the world's number one Navy to guarantee open roads to the sources of supply? Smugness gave way to alarm and near-despair as Japanese aviation quickly closed one Pacific door after another to us. We were totally cut off from Manila hemp, silk, quinine, and rubber; we lost 90% of chromium, 87% of tungsten, 85% of mica, 80% of tin, 60% of wool. It was a tragic miscalculation, due to the failure to comprehend the new relation of forces in the air-power age.

We are apparently heading for another such disillusionment, and for the same reason. Once again we are basing our strategic and war industry plans on materials that are certain to be denied to us by enemy air power, either as soon as war breaks out or as the conflict gains momentum.



The body blows struck by Japan when it sealed off our normal sources of supply in the South Pacific have alerted us to the problems of economic warfare. But limited vision in high places leads to confusion with regard to solutions. Evidently we are again counting on essential products from areas like Africa, the Near East, Indo-China, China, India, etc., without realizing that they can and will be denied to us by enemy action.

Quite properly, American diplomacy is concerned with access to deficit rawstuffs if and when war comes. Much of that diplomacy, however, is being focused on places which will be forbidden to us, regardless of how friendly and co-operative the local governments may be.

It is no secret, for instance, that our foreign policies in the Near East have been strongly influenced by strategic considerations, especially the availability of oil. But what if it should develop that the region is closed to us under the conditions of modern air power? Obviously a lot of money, political zeal, and possibly some sacrifice of national principle will have been wasted. More important, military-political preparations and industrial investments in other, more realistic directions will have been neglected.

It would clearly be foolhardy for Soviet Russia, in preparing for a possible conflict with the United States, to count on vital materials from the West Indies, Central America, Mexico, and other sections subject to direct attack by the whole American Air Force operating from its home base. It makes no more sense for us to rely on sources which can be readily demolished or intimidated by the Soviet Air Force operating from its heartland.

The analysis which follows assumes a striking range of five thousand miles by both belligerents. The United States already has the equipment for such range. It is only common sense to assume that Soviet Russia will also have it.

Under these circumstances we are driven to make two significant conclusions: (1) before a new World War runs its course all sources of strategic supplies outside our own Western Hemisphere will be denied to us by enemy aviation; (2) to avoid calamity we must begin without delay to make the Americas, from Arctic to Antarctic, self-contained as far as the rawstuffs of modern war-making are concerned.

The same considerations which make overseas bases untenable will apply to overseas sources of supply. In any new war it will simply be impossible to defend remote areas against the major striking force of the enemy, or to enforce local air control dependent on long overseas supply lines.

With the attainment of a five-thousand-mile striking range, the entire economic map of the globe in time of war will fall into a new pattern. The world will be divided into two geographical halves. We shall be excluded from the enemy half as effectively as he will be excluded from ours.

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2

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OUR GEOGRAPHICAL IDEAS have been shaped by the old two-dimensional means of transportation. In the aviation era they have lost most of their meaning for peacetime and have ceased to have any meaning for times of war. Distances and space relations, measured in time and direction of flight, are completely different.

We have been accustomed to thinking of Asia as located to the west of us, with Europe to the east. But in the aerial age we must get used to looking "down" on our planet from the North Pole. From that vantage point compass directions are thoroughly reshuffled. The "polar projection" displaces the centuries-old Mercatorial map. It should be made standard in our schools, in order to erase outworn geographical concepts. Defense and security plans influenced by the old geographical notions have become wholly unrealistic.

Viewed from the North Pole, the continents which had seemed east and west of us, it becomes apparent, really lie due north. Europe and Siberia lie *between* us and Africa, the Sudan, India, Indo-China, the East Indies, northern Australia. In hostile hands this dual continent constitutes a barrier blocking our aerial access to those regions, which are a sort of aerial back yard of Soviet Russia, the dominant air-power nation of Eurasia.

By the same token, however, South America is *our* aerial back yard, safely outside the aviation reach of Soviet Russia. Our North American land mass stands as a barrier between Eurasia and Latin America. Shipping between North and South America will be coast-wise and generally beyond the striking range of Soviet air forces. It

will avoid the submarine peril by moving always under an umbrella of air power firmly anchored on the American shorelines.

The map facing page 312 represents graphically the power equation between the American and the Eurasian continent, both disposing of five-thousand-mile striking ranges. The "reach" of North America is fixed by its four extremities: Alaska, Newfoundland, California, and Florida, in an approximate square. The portion of the globe dominated by American air force of five-thousand-mile striking radius operating from these outposts forms a vast circle (depicted in blue). An effective American air force-in-being could destroy any target in this area.

The U.S.S.R., bounded by such extreme points as Murmansk, the Caucasus, Kamchatka, and Baikal, is somewhat elongated. The area covered by an equivalent Soviet air force-in-being, operating from the periphery, can be represented by an ellipse (shown in yellow). Theoretically, the Soviets could destroy any target in this area.\*

Where the American circle and the Russian ellipse overlap—the green portion—will be the aerial no-man's land, where the struggle for mastery of the whole air ocean will be unfolded. The area within reach of the striking air power of both nations includes the industrial vitals of both belligerents. That will be the combat area, the Area of Decision. Here the offensive potential of each nation will confront the well-deployed and well-supplied defensive air force, guided missiles, and the rest of the defensive potential of the other nation for the decisive struggle.

In time of all-out air war, reliance on strategic materials in the yellow and green zones of the opposing hemisphere would be a major blunder. To secure unmolested economic relations with, let us say, the Southwest Pacific, India, the Near East, and the northern half of Africa, we would have to provide every one of those regions with air defenses sufficient to overcome the entire Soviet striking air potential. For the same reasons, the masters of Eurasia will be denied access to Central and South America.

In our discussion of the naval problems, especially with respect to

\* If it can use Communist China as a base, Russia does not have to have five-thousand-mile striking range aircraft. She can accomplish the same thing with the B-29 type of plane, which is already in mass production in Russia.

submarines, it was noted that in future wars lines of communication will no longer be the primary target of enemy action; the attack will be directed against the *sources* of supply. Within the area of its dominance, the commanding air-power nation will not even have to do any actual bombing to impose its will. The mere awareness of vulnerability will usually be enough to intimidate countries and regions tempted to trade with the opposing belligerent. To any colony or country possessing materials coveted by the United States, the Kremlin need only say, "Desist or we shall annihilate you!"

Any investment we make today in the yellow zone with the intention of assuring a flow of strategic supplies in wartime is therefore sheer waste. It is as unrealistic as would be investments for the same purpose by Soviet Russia in our blue zone. Common sense demands that we channel economic preparedness only into the zone we can successfully defend.

This picture is not the product of arbitrary decision. It is dictated by the new geography, which is in turn conditioned by the new stage of aeronautics. It leaves us no reasonable alternative to the intensive development of sources of critical materials in our own Western Hemisphere. Potentials south of the Rio Grande must be exploited. Items that cannot be developed in time must be stockpiled without delay.

Research and production of substitute materials ought of course to be stepped up. At present we are not doing this. Worse, we are destroying elements of relative economic autonomy painfully built up in the recent war.

Take rubber, for example. By the end of the war we had attained productive capacity in synthetic rubber sufficient to satisfy our peak demands. But, incredibly, we hastened to dismantle this war investment! We left ourselves dependent once more on Asiatic sources, putting our heads into an Asiatic noose which Soviet Russia can pull instantly with the start of hostilities.

The blunder is particularly distressing for two reasons. In the first place, we are not likely to be given the time again to generate a synthetic-rubber industry without molestation in a new war. Secondly, had the industry been kept in full swing, the quality of the product would certainly have been raised, perhaps to a point where it would have had advantages over the natural product.

Our economic planning must discount rubber and tungsten from the East Indies and China, oil from the Near East, hemp from the Philippines, and all other important supplies heretofore provided by sections in the yellow zone of our map. A premium should be put on weapons forged out of materials available in this hemisphere.

The Eurasian continent is naturally self-contained. To cut its exterior lines of communication would be a futile gesture. In spite of their inexhaustible natural resources, the Americas unfortunately are not yet that self-sufficient. Our immediate objective should be to make them so.

Under the conditions of tomorrow's global war, the common defense of our hemisphere by all the nations of the Americas is no longer merely a desirable goal but a dire necessity. South America cannot survive without the kind of defenses that only industrial United States can generate. The United States in turn cannot mount a modern war successfully without the natural resources of South America, actual and potential.

In the spring of 1949 I flew to South America on invitation of the governments of Argentina, Chile, and Uruguay. I discussed hemispheric security problems with the presidents of each of these countries, with their respective cabinets and defense ministers, and naturally devoted much of my time to conferences with the highest Air Force officers. I not only visited all important defense installations but was enabled to inspect industries and sources of national materials of military significance. Lectures to audiences of highest military personnel and diplomats gave me the opportunity for enlightening cross-questioning. Later I rounded out the study with a visit to Brazil, for conferences with the Minister of Air Defense and other military leaders.

Against this background I am able to report that South America is keenly conscious that its fate, in military terms, is linked to that of the entire hemisphere. Certainly in these four major countries there is a wholesome recognition that war among themselves has become a physical impossibility. Such fear of neighbors as remains is political rather than military. The thesis of a unified hemispheric defense against any common enemy from the Eastern Hemisphere found understanding and, usually, enthusiastic acceptance.



As against the world threat of Communist aggression, the nations of South America are definitely on the side of the United States. Everywhere I found an awareness that Red infiltration in South America is a vital element in Communist strategy. Events in Bolivia, Ecuador, Central America, and other places have left little doubt that the process of Communist "boring from within" is well organized and well financed.

A certain confusion and even resentment is caused by the fact that in the offensive against world Communism the U.S.A. is concentrating on Europe and Africa to the neglect of its hemispheric neighbors. The consensus of South American opinion could be summed up as follows:

"Washington realizes that economic distress makes a breeding ground for the Kremlin's fifth columns. Therefore it is trying to raise the economic level in Western Europe. But the situation is analogous in South America. Here, too, economic difficulties are being exploited by Communist organizers and propagandists. But Washington seems oblivious to this fact.

"Our populations are industrious. We have almost unlimited possibilities for industrialization, mining, and so on. But we lack the capital and we lack markets. How can we hope to sell our goods to European countries, for instance, when they are getting such goods virtually free from the United States?"

If South America were irrelevant to the next World War, we could afford to ignore its point of view. But this continent will be indispensable to us in a struggle. Precisely because it knows this, the Soviet Union is tireless in its efforts to create cleavages and misunderstandings between the United States and its neighbors to the south. Its hopes are geared to the social disintegration of Latin-American areas through economic deterioration.

Serious misunderstandings between the United States and Latin America remain to be resolved. There is ample reason to suspect that they are in some measure provoked and exploited by elements with a vested interest in misunderstanding. From the standpoint of the Kremlin it is important to prevent genuine unity of the American hemisphere. The principle of divide-and-conquer that has stood Moscow in such good stead in Europe finds expression in promotion of





Area under  
Soviet aerial dominance  
Area under American  
aerial dominance

"Area of deviation," which includes the industrial hearts of both nations, and is within striking range of both air forces.

Within this area—

The *Blue Circle* district of the British Isles, not only tonnage overseas, but also the industrial capacity and manpower to generate air power for control of its own skies.

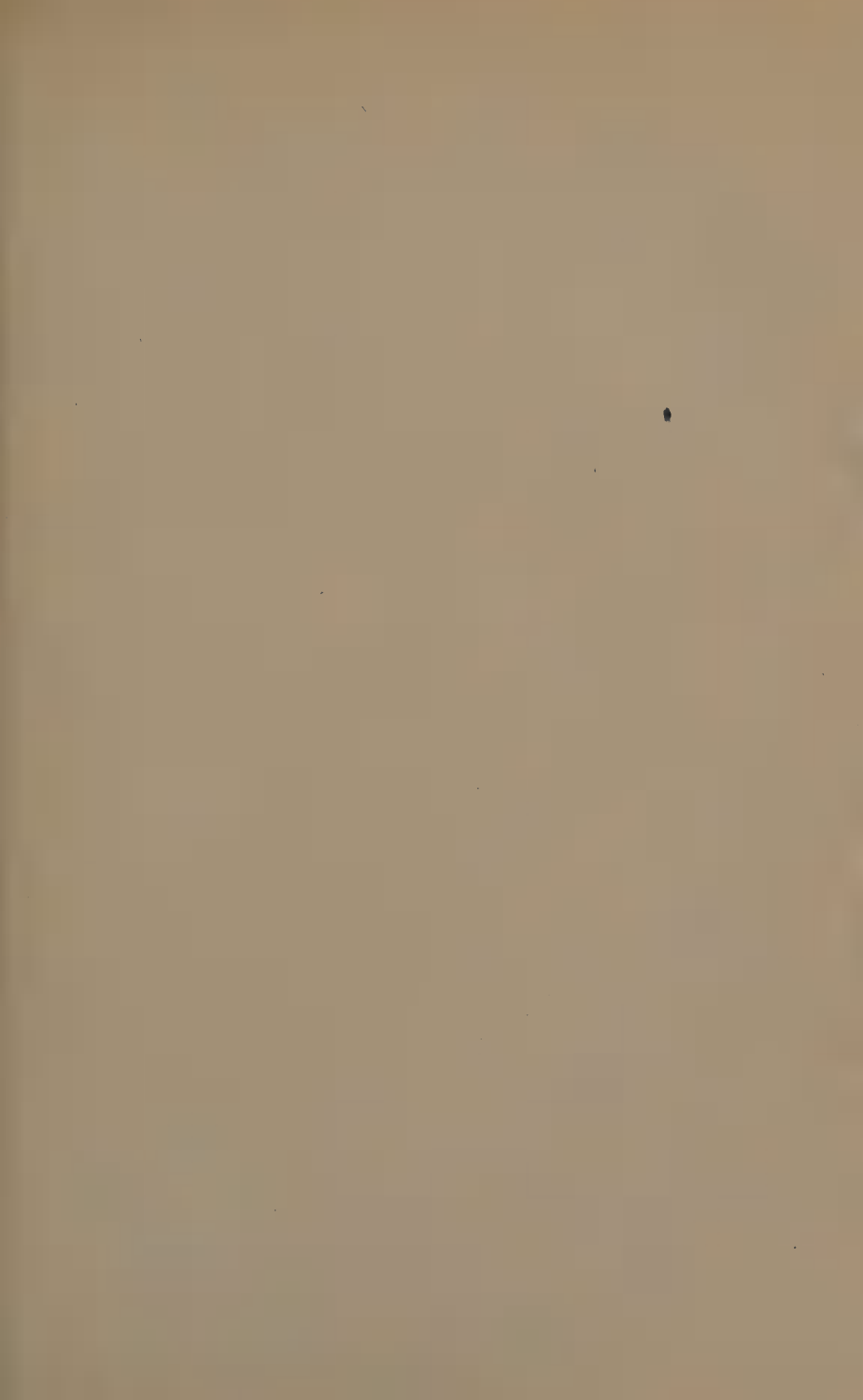
The *White Circle* embraces Alaska and Kamchatka, where land-sea-air teams will have valid application in an attempt at initial neutralization of strategic bases.

### THE POWER EQUATION BETWEEN THE AMERICAN AND THE EUROSIAN CONTINENTS.

To hide aerial age we must get used to looking "down" on our planet from the North Pole. The continents which seemed east and west of us really lie due north. Europe and Siberia lie *between* us and Africa, India, the East Indies, which are a sort of aerial back yard of Soviet Russia. By the same token, South America is our aerial back yard, safely outside the potential 5,000-mile striking range of Soviet aviation.

An adaptation of this map accompanied an article by the author in *This Week* magazine, February 13, 1949.







trouble between North and South America, and also among the Latin-American nations themselves. That divisive strategy will be effective as long as this country remains aloof from South America. Our self-interest dictates a wiser, more consistent policy of co-operation.

The Latin-American countries are proud and sensitive; they are aware that we need their help even as they need ours. They do not ask for gifts but for opportunities to collaborate as equals among equals. Our very stature and power require that we act in a spirit of fair neighborliness, and we can expect that it will be answered in kind. A revision not only of our policies but of our attitudes seems to me essential.

The political climate for unified defense preparations for the entire hemisphere, from Canada to Cape Horn, is better than ever before in American history. Whether it will be utilized effectively and in time depends largely on a sharpened consciousness of the need on the part of the American people and their government.

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THE FIRST STEP, as I see it, is exploratory: a systematic study and appraisal of the economic potentials of the entire hemisphere, through an Inter-American Resources Planning Board. In recent United Nations discussions on world resources which I attended, the possibilities of aerial surveys were described. The vast spaces of South America, some of them completely uncharted from the economic angle, lend themselves to this type of investigation.

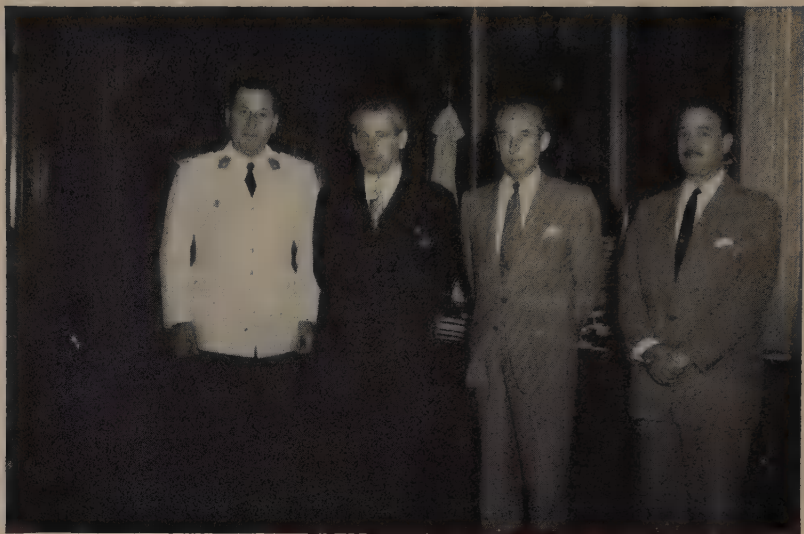
We know that the great continent contains key strategic materials which lie fallow or are being produced on a quite small scale. It holds the answer to our crude rubber needs, for which we are now largely dependent on Pacific areas. The same is true of a series of other important rawstuffs.

The manganese we now receive from Soviet Russia is only 55% efficient. To obtain it we make it possible for the Soviets to get our machine tools, radar equipment, and other goods of military value. Yet there is enough manganese in Brazil, of 70% efficiency, to supply the needs of our whole steel industry. Tungsten and wolfram, for which we are now largely dependent on China and adjacent areas,



The author confers with South American leaders on problems of hemispheric security. *Above*—With Gabriel Gonzales Videla, President of Chile (extreme right); Major de Seversky is flanked by Generals Felipe Latorre and Gregorio Bisquert of the Chilean Air Force. *Below*—With Uruguay's President Luis Batlle Berres.





Argentina has made a good start in the defense of the Americas by equipping its fighter force with fast British-built Gloucester *Meteor* jet interceptors, shown here on the airfield at Tandil. *Above*—With President Juan Domingo Perón, in Buenos Aires. From left to right: President Perón; the author; Alphonse Landa, international lawyer, of Washington, D.C.; and Cesare Ojeda, Argentina's Minister of Air.



can be made available in northern Argentina, Bolivia, Chile. The cobalt so crucial for jet engine production is known to exist in several parts of South America.

What else the survey will reveal cannot be surmised in advance. But there is every reason to believe that the Americas, if intensively exploited, can more than match the Eurasian land mass. Our hemisphere *can* be made self-contained and independent of the Old World.

I am aware of the time element. Stockpiling in peacetime is of tremendous importance. On the other hand, proper stockpiling is not possible until a definite and proper strategy has been evolved by our country. At this writing, because we have no strategy (but only a miscellany of overlapping and mutually exclusive strategies), the stockpiling is haphazard, costly, and chaotic. Every service is storing up all it can, though in the nature of the case only a fraction of it will be useful for some of them. If we are planning to have the greatest Army, Navy, and Air Force all at the same time, the stockpiling will have one complex. But if our Air Force is to be the major striking force, it will be entirely different. One major change, for example, would be to place the accent on aluminum, magnesium, light alloys, and ceramics, rather than on steel and heavy alloys.

It has been officially stated that it will take us at least three years to provide an adequate stockpile of essential strategic materials. But the development of new sources of supply in South America, guaranteeing us a *continuous flow* of most of these materials, could be accomplished in the same period, if not sooner.

The scope of the proposed hemispheric Resources Planning Board should be wide enough to embrace agricultural as well as industrial potentials. Though we still think of farming as related solely to food supplies, it is also a vital industrial reservoir. The magic of modern chemistry has turned the products of the soil and of livestock into pillars of industrial strength; many have been converted into components of modern weapons.

We should contemplate a far-reaching reorientation of our farming and related industries in line with South American productive capacity. We must look to that continent, and especially to Argentina, to make up the margin of cattle, leather, and farm products which will be



drained off in the United States for indispensable war weapons.

One of the great errors of American policy, to my mind, is the lavish pouring of American resources into Africa, under the banner of military security. Insofar as this is an extension of the European rehabilitation program, it may be justified. But we must realize that the African continent will be indefensible, both as a source of supplies and an area of operations.

Having been successful in invading Northern Africa in the last war, we are through sheer inertia staking hopes again on that land mass. It is the same old pattern of preparing for tomorrow on the assumptions of yesterday. We forget that what was possible against Germany's short-range aviation will be prohibited against Russia's long-range air force. In spreading ourselves to such overseas areas we are playing into Moscow's hands. The northern half of Africa is closer to the enemy's major air strength than to our own.

Moreover, the same resources channeled to South America would be a more realistic investment from another point of view. The native African population is at least a century behind the South American: to industrialize them to a substantial degree would take at least half a century and would therefore be irrelevant to the struggle now on the horizons. South America, by contrast, is already well started on the road to industrialization and could be made a vital economic factor in the immediate future. This is especially true in the temperate zones, where I found that the inhabitants have native mechanical aptitudes, which could rapidly be developed into industrial skills.

The standard excuse for not exploiting the manganese of Brazil, and thus freeing ourselves from dependence on Russia, is the lack of rail transportation. Yet today we are building several railroads, not in Brazil but in Africa—railroads which can be crippled in the first stages of hostilities.

In the economic as in the military sphere, it would seem, we are minded to spread ourselves within easy reach of the potential enemy—as if determined to make it easy for him to devour us piece by piece. It is appalling to note how we neglect our natural base of operations, South America, while channeling wealth and resources to the most vulnerable areas, adjacent to the Soviet domain, where they would be overrun or obliterated with the start of hostilities.



An example of this strange illogic was provided by recent E.C.A. loans for development of tungsten in Korea. Without doubt we need that metal. Our main source in the past, China, has been lost to us, unless the Communists maneuver us into trading our latest technological know-how for tungsten, as we are doing for manganese. Yet there are rich tungsten deposits in South America, beyond reach of hostile aviation and easily transportable by air or by coastal shipping. Why we are making the investment in the heart of the Communist world, on the very frontier of the Soviet Union, instead of reactivating the South American mines, defies understanding.

Parallel with orderly economic planning on a hemispheric scale, of course, we must have military planning to match. A common strategy of air defense must be developed. The radar alert system now being blueprinted for the United States and Canada should be drawn around the hemisphere, uniformly from the Arctic to the Antarctic. Standardization of equipment, recently negotiated among Great Britain, Canada, and the United States, should likewise be extended to embrace the entire hemisphere.

The primary goals of the South American air forces will be defensive, to safeguard bases and sources of strategic supplies. Instead of being saddled with futile war surplus materials, those forces ought to be provided with the latest interceptor jet fighters, guided missiles, and other paraphernalia of a modern air defense. (Argentina, incidentally, has had the wisdom to equip itself with a hundred-per-cent jet fighter force, flying the Gloucester Meteor planes made in Great Britain.)

Some Americans are concerned about the risk of encouraging inter-American wars by arming South American nations. An understanding of the hemispheric defense picture should be reassuring on this score. Under a general hemispheric plan such as I am urging, the equipment with which South America would be endowed would not be of a type suitable for aggression and conquest, but essentially defensive in character.

It is not unnatural for all countries to want bombing fleets. The fact, however, is that only the United States can support strategic action on the modern scale. A division of functions, with South America concentrating on the defensive, is consequently unavoidable. Latin-

American nations with extensive ocean frontiers will, of course, need some large aircraft for coastal patrol against hostile submarines.

Brazil, besides taking a leading part in the defense of its continent, has an additional role. It must provide and defend the bases for use by American air force in direct action against the enemy in Europe and Africa. The airdromes developed in that country in the last war primarily for air-transport purposes will come to life again—this time for direct offensive purposes. They will have to be heavily protected, with local air defense in the hands of the Brazilians.

Such a program of common defense, I am convinced, would not only encourage greater solidarity between North and South America but also among the Latin-American countries themselves. Many of their military problems are wholly complementary.

South America grows narrower as you approach its southern tip. In view of the high velocities of modern warfare, it is obvious that Chile and Argentina are completely interdependent. Against an attack from the west, Argentina must rely on Chile's capacity for detection, interception, and alert; Chile is similarly dependent on Argentina from the east.

We have military air missions in many South American countries. But I found as yet little integration of thinking with regard to such common problems. In Chile our mission is asked to help develop what is primarily a tactical air force, for the co-operation of air with ground and mountain troops. In Argentina, on the contrary, the emphasis is on the strategic use of air power. Meanwhile, our mission in Brazil is being pressed for bombing planes.

There is all too little co-ordination of effort in hemispheric terms. Our Brazilian mission, which has top-ranking personnel, gets its directives directly from Washington. The other missions are subordinated to the Caribbean Air Defense Command, located in Panama. In short, the problems are being treated as though they were separate and unrelated.

It seems indispensable that an integrated overall plan be projected, with centralized control of all South American military aid. I feel that the central headquarters should be located in some minor but culturally robust country, a South American equivalent of Switzerland, to avoid friction between the larger nations. Uruguay seems well

suited for this purpose. Its position between powerful Argentina and Brazil makes such a choice additionally desirable.

Not only should our whole intricate setup of air defense be extended and co-ordinated to cover all the Americas, but, by the same logic, their production should be spread, as far as practicable, through the hemisphere. Only in that way can we avoid clogging and overburdening transport facilities within the Americas when the challenge of war is upon us.

Because airlift will inevitably grow as a substitute for surface transportation—in intrinsic value of cargo if not in tonnage—Latin-American air lines should be built up. They ought to be helped to achieve autonomy of operation through the necessary depots, repair shops, maintenance facilities, as well as plants for the production of huge cargo planes and their spare parts. Already wool is being flown out of Argentina. As far as meat is concerned, transport by air is becoming more efficient and economical even with existing planes.

In any new World War, as I see it, the American hemisphere will be divided roughly into three belts. The first, comprising primarily Alaska, Canada, and Newfoundland, will be the *deployment* belt, from which our striking air forces will carry war to the heart of the enemy. That it is desirable to have the locations of the striking air forces and of industrial means widely separated should be self-evident; since both are legitimate targets of hostile air power, their geographical separation will split the enemy's effort.

The second, the United States proper, will become the *industrial* belt, providing the means with which to wage war. It will be the primary target of enemy attack and for that reason will require the most concentrated defenses.

The third, all of Central and South America, will become the *supply* belt, the vital reservoir of strategic materials and supplementary food.

These functions will of necessity overlap. But the three-belt concept is useful as a guide to our overall thinking and planning in hemispheric terms. The Americas have no alternative but to make themselves as self-contained economically as the Eurasian continent. The time to begin to provide economic independence is now. That is a challenge to American statesmanship and economic good sense.

## OUR MILITARY ESTABLISHMENT

## 1

SINCE THE SUMMER of 1947, when the newly unified Department of Defense was launched, the American people have watched, as through a glass darkly, a mystifying struggle among the three services: Army, Navy, and Air Force. Because the issues have nowhere been clearly defined, the public has become more and more bewildered.

Emphasis on the word "bickerings" has been unfortunate. Had the differences been dignified with a serious label, had they been billed as a great military debate, their importance would not have been so sadly blurred. But the picture projected on the public mind was of a lot of officers feuding over money and privileges, the kind of quarrels that can be ironed out by a firm administrative hand.

Then, in the fall of 1949, came the sensational "blow-up" in Congressional hearings precipitated by "rebels" in the Navy. As the spectacle unfolded, the nation began to sense that these were not paltry bickerings at all but deep-reaching conflicts of opinion on weapons and methods of conducting war. The readiness of high-ranking naval personnel to defy superiors and risk their careers revealed the earnestness of their concern. The treatment of the interservice tensions as a squalid squabble over personal advantages, intelligent observers realized, had been utterly ungenerous toward the military men involved. The fact is that each of them is patriotically defending his innermost convictions.

One thing, therefore, should be clearly understood. The differences between the Army, Navy, and Air Force are not trifling. On the contrary, they refer to the most basic strategic concepts and problems. There are also secondary disagreements which can and should be adjusted by an able executive. But the fundamental questions are related

to the nature of the whole defense program. To hide or to soft-pedal them is to prejudice the chances of a correct and timely solution through democratic processes.

Under the noise and confusions is the reality of a head-on clash of old and new concepts: specifically, between the makeshift land-sea-air strategy evolved in World War II and the all-out air strategy made possible by technological progress. As we have seen, the advent of a new military force means that the world faces far-reaching changes in methods of making war. And the location of the two leading powers, the U.S.A. and the U.S.S.R., on different continents makes those changes urgent and inescapable. We cannot continue to pretend that nothing essential has changed, or that the profound issues can be resolved behind closed doors by a few admirals and generals on the basis of "good will" or "discipline."

The cure for "bickering" urged from so many directions—to arm the Secretary of Defense with absolute powers—is worse than the disease. Under our way of life there is no possible form of discipline that can prevent principled military men, who feel that mistaken plans leave the country in danger, from carrying their feelings to the nation. Naturally, when they do so they must be prepared to take the consequences. This has not undermined discipline in our armed forces in the past and never will.

Tactics and weapons—I must repeat—are the province of specialists and should be kept under wraps. But strategy, the basic plan of war, must not be hidden from the world. It announces itself unmistakably, in any case, in a country's industrial setup, allocation of materials, foreign affairs, and a hundred other ways.

Could Napoleon have disguised his plans of conquest with great armies? Could England in the past have concealed its intention to be overwhelmingly potent on the seas? Even if it had been possible, they would not have wished to camouflage the nature of their strength. If strategy is to serve as a deterrent to possible enemies, it *should* be known to everybody.

In the epoch of total war, strategy calls for sacrifices and co-operation by the entire population. It cannot be effective unless fully understood, ratified, and supported by our people. Strategic decisions affect not only the military but every aspect of a nation's life: its industry,



raw-materials plans, diplomacy, education, everything. Alternative plans must be laid fully and frankly before the President, the Congress, and the American people for their appraisal. Indeed, the people and their representatives have a responsibility they cannot evade—to learn all the facts and ultimately make the vital strategic judgments.

Civilian control of the military establishment is a democratic premise on which everyone agrees. But too many fail to understand that centralized authority to “settle” strategic disputes, even if vested in a civilian, is incompatible with such control. A dictator in mufti is no less a dictator than one in uniform. Hitler, despite his pretensions, was not a military man; yet there was no room for civilian influence in his military machine.

No, the formality of a non-military department head is not enough. The essence of civilian control is wide popular participation in the primary strategic decision. It means the unabridged right of the people to know the pertinent facts and problems, and their unabridged obligation to take part in the decisive choice.

In a democratic society there is actually no alternative. The attempt to keep out the people, to gag dissenters, may succeed for a while, but the inner pressure built up will explode in due time into public scandals. Cautioning against the tendency to load the Defense Secretary with all-out power, I wrote that it “can only lead to revolts within the military establishment, followed by disciplinary sanctions against ‘rebels’ and the loss of vital military brains to the country.” \* A few months later the naval explosion fulfilled the warning.

The remedy for interservice disagreements widely urged for several years, as tensions increased, had boiled down to endowing one man with well-nigh dictatorial powers. Full power for the Secretary was the theme song of endless articles. At least one of these had the virtue of candor. It made proposals which would give the Secretary of Defense “exclusive power to draft” military budgets and “full authority over their presentation to Congress”; “power to require the services to speak with a single voice and to summarily discipline those who speak out of turn.” † In line with this plan, Mr. Forrestal himself asked

\* “Are We Headed for Military Dictatorship?,” *Pageant*; April, 1949.

† “Is Disunity Wrecking Our Defense?,” by William B. Arthur; *Look*, September 18, 1948.

that the Defense Secretary be given the "right to hire" the Secretaries who head the three services.\*

Had this plan been accepted, civilian control would have become an empty formula. The military establishment would have been removed from democratic direction. Congress and the President would have been limited to one official program, on a take-it-or-leave-it basis. Through control of the purse, public opinion—by way of Congress—might still have influenced the *scope* of military preparedness but not its *nature*.

The irony of the story is that the propaganda for extreme regimentation was largely generated by the Navy, which previously had fought against unification. It had finally accepted unification on condition that Navy roles and missions be written into the law and that Mr. Forrestal, the Secretary of the Navy, be made the first Secretary of National Defense. With the launching of the unified setup, the Navy made an about-face, and began to promote centralized authority. Then fate intervened. Mr. Forrestal, shortly before his death, was succeeded by Louis A. Johnson, a man better able to comprehend the air-power viewpoint. Within the limits of the law, the new Secretary proceeded to use the kind of one-man authority the Navy had been urging. But when the admirals found his decisions to be unacceptable, they promptly and dramatically carried the issue to the people.

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THE FIRST WORLD WAR ended without any startling new strategic developments. True, airplanes were used for the first time and their efficacy was improved in the war years; it was obvious that their size, speed, and firepower could be stepped up. But this was simply the addition and improvement of another weapon for enhancing surface warfare. Basic strategy was known and fixed, whatever adjustments might be made within the established pattern.

Unification of our military structure would therefore have been possible at that time. We did not choose to unify. On the contrary, the Army and Navy treated each other almost as hostile forces. Air

\* "Can the Army and Navy Get Together?," by James Forrestal; *Saturday Evening Post*, November 27, 1948.

Force was split in two, each half completely subjugated to earth-bound minds in the major services. Not until Pearl Harbor demonstrated the weakness of the organizational setup was the possible need for unity so much as admitted.

The Second World War, by contrast, ended on the threshold of the most far-reaching changes in the annals of human conflict. The whole foundation of war-making was rendered obsolete almost overnight by the appearance of aircraft of hemispheric range. For the first time in history, an entirely new medium for the conduct of war became accessible: the air ocean. It demanded the creation of a new military force suited to this medium—and a radical revision of all inherited strategic concepts.

It became apparent that many of the World War II methods would have little if any relevance for future conflicts. At the very minimum a re-examination of all accustomed military thinking was called for. But precisely in this period of revolutionary readjustment, we have chosen to “integrate” the services. Arguments are being made for regimenting the establishment, to “discipline” the new force; attempts are being made to perpetuate—*by law*—strategy and tactics of World War II vintage.

Through mere seniority, surface strategists are in substantial control, making final decisions involving the use of a force about which they know little and to which they are generally hostile. They assume that if new strategy is needed, it will develop gradually, step by step, out of the World War II experience. They do not grasp that it will not be a *refinement* but a total *repudiation* of past methods. And it is not difficult to explain their error. In the light of their particular traditions, they are honestly petrified by the prospect of warfare suspended, as it were, in the blue—without the old reliable props on land and sea. They shy away from the vision as if it were some kind of Indian rope trick.

Under these circumstances, centralized authority is no longer practicable. It would almost preclude the possibility of making a correct decision. My strictures, in other words, are not against integration in principle but against the timing.

The essence of the matter is in the transitional character of the present period. We are in a unique historical moment, necessitating a

unique approach organizationally. To our generation has fallen the responsibility for a fateful choice among competing military ideas. To leave the formulation of the overall strategy to a single authority without benefit of free discussion would be a victory for bureaucracy over common sense.

At a time like this the widest possible latitude must be allowed for creative strategic minds; for the ability to cast off textbook precepts and visualize the emerging laws of warfare. A premium must be put on bold innovation and mental freedom rather than on orthodoxy or compromise to show "good will."

Our military establishment today should be in line with these compelling realities. Those endowed by law with the most power do not necessarily have the most wisdom. Besides, under our way of life neither laws nor executive edicts can be enforced without enlightened public approval; our experience with Prohibition is the classic lesson in this respect.

The memorable Congressional battles over the 70-group Air Force in 1948 brought a major dispute into the open. The first thing to be noted is that the question was not a petty one but one which went to the heart of our strategic plans. The second is that Congress ultimately gave almost unanimous support to the "insubordinate" Secretary of Air, overruling the views of the Department head of the time.

Suppose that the appeal to public opinion had been forbidden, or that we did not have a Secretary of Air as courageous and patriotic as Stuart Symington. The air-power argument would have been suppressed. The American people would not even have known that a vital conflict of opinion existed.

One of Mr. Johnson's first moves, after assuming office, was to issue an administrative edict calling off the construction of the projected aircraft supercarrier. I have already given my reasons for considering the naval mastodon a waste of money and no more than a monument to confused military thinking. Thus I found Mr. Johnson's action justified from a military point of view. Nevertheless, it seemed to me a dangerous precedent. The issue is not whether a particular decision on fundamental military concepts is right, but whether any one person should be vested with life-and-death authority over America's

destinies. The power to make correct decisions implies equal power to make disastrous decisions.

Under the outwardly innocent demand for increasing the size of the carriers lurked the Navy's ambition to extend its strategic role beyond the seas, deep into the interior of hostile land masses. It was not, therefore, a matter of building a single mastodon. To carry our strategic air effort to the enemy on floating bases effectively would require hundreds of these supercarriers at a cost of hundreds of billions of dollars.

Cancellation of the supercarrier had more far-reaching implications than the country grasped. That ship is the supreme expression of naval strategy under present conditions. As long as the Navy is treated as a primary strategic force we cannot withhold what it considers its basic weapon, any more than we could reasonably deny long-range bombers to the Air Force or the best tanks to the Army. The Navy's attempt to perpetuate its strategic function in the air age reached an extreme of absurdity in a patently absurd weapon. In canceling that weapon Mr. Johnson in effect was ruling that the Navy had lost its strategic role as an offensive force. But the decision to change the status of the Navy from a primary strategic force to an auxiliary should have come first, after which the elimination of the supercarrier would have followed as one of the obvious consequences. We must not confuse the creation of overall strategic concepts with their administration and implementation.

The basic question was not whether to give the Navy a floating island or two. It was whether our country and its industrial complex should be turned into a huge shipyard producing naval vessels and miscellaneous tactical aircraft—or whether America should become an air-power nation, devoting its industrial potential to the tools for taking command of the skies all over this globe.

Any such fateful decision clearly should not be made by a single individual. The conflicting views on the carrier should have been fully canvassed by Congress and the President. Since the subject goes to the core of our strategy, affecting the very foundation of our military establishment as fixed by law, the entire discussion should have been in the open. The danger is not in the so-called bickerings. It is in the cessation of bickering on the inadmissible basis of deals, bargains,



or administrative duress. Should a phony interservice peace be enforced, we shall have reason to worry. It would mean that the great debate on proper strategy will have been choked off.

But, as the naval "rebellion" clearly showed, it would not remain choked. Military thinkers of principle, whether admirals or airmen, are not likely to submit meekly to what they consider calamities. Honest differences of opinion in the military domain are natural and wholesome at any time. At present, when scientific advances demand drastic recasting of military assumptions, intellectual rivalry is understandably sharp. Because the stakes are high—peace or war, victory or defeat—the disputes are naturally touched with passion. But this is as it should be.

The majority report of the Hoover Commission military "task force" proposed "strengthening central authority" and "improving teamwork" in the military family. Its emphasis was on "smoother performance of the security machinery." Those who drafted it evidently did not consider the supreme problems of the period: *the reorientation of strategic thought and how it can be achieved most rapidly, most correctly, within our means.*

Concentrating on "unity," they forget that a smooth-running machine will hardly serve America's best interests if it is running in the wrong direction. No one can quarrel with suggestions for more efficient administration. But insofar as it affects overall planning in this transitory period, the drift toward regimentation must be resisted.

ADVOCATES of approximate regimentation insist that Congress, being "a bunch of civilians," is not qualified to make strategic decisions; that the matter is too technical to be entrusted to the people. This is a dangerous theory. If accepted, it invalidates our whole democratic idea of self-government.

If civilians without specialized training are unfit to determine basic strategy, then they are equally unfit to determine atomic-energy policy, foreign policy, military alliances, trade treaties, and other intricate phases of national life. These, too, are highly technical. Yet Congress, after studying diverse views and claims, has always laid

down the main lines of policy. The soundness of the method is a historically demonstrated fact. The logic of the opposing contention would reduce legislatures to rubber stamps for experts in every important area.

The experts certainly know best in matters of detail, in the mechanics. But in fixing overall policies they have no monopoly on wisdom. Often they are hampered by their professional interests and loyalties. It is a matter of record that in the war public opinion was ahead of the military leaders on many broad strategic questions. Congress makes mistakes—but no more and no more serious than those made by executive officials exercising delegated powers.

Congress has often been a convenient whipping boy for military blunders. Beginning with Pearl Harbor, Army and Navy men alike have been inclined to blame the people and their representatives for initial defeats. Had military chiefs had more money to work with, they implied, everything would have been different.

This view neither was fair to the American people nor did it correspond to the facts. The defense of the nation had been put into the hands of experts. In appraising what they did with that responsibility, it appears that the trouble was far less in the matter of quantity than in the matter of quality. It was not a case of "too little and too late" but a case of the wrong things in the wrong places. And for that, assuredly, the blame rests with the experts, not with those who paid their wages.

The island of Guam has long served as the prime example of the shortsightedness and niggardliness of Congress. But suppose that Congress had provided the funds for Guam, what would have changed? Our fleet would then have been sunk in the Guam harbor instead of Pearl Harbor. The disaster would have been even more tragic: the entire Guam garrison would then have been slaughtered, taken prisoner, and subjected to a death march. We know that even with limitless money at its disposal, the Navy would not have invested it in air power. Guam and other Pacific islands would have been turned into a few more futile naval bases, to be swamped by Japanese air might.

Whenever a military man refers to the parsimony of Congress, he should be reminded that until the very day of Pearl Harbor the American people were being assured that the country was adequately pre-

pared; those who differed were called crackpots. In September, 1940, during his visit to Hawaii, Secretary of the Navy Knox informed the American citizenry that "the United States has the greatest, the most powerful, and the most effective fleet on the high seas anywhere in the world."

What he did not say—because he did not understand it—was that naval strength had become secondary in the strategic picture. Because our strategy was fallacious, additional funds would simply have given us more of the futile weapons. Indeed, the fact that we had too little to spend meant only that we provided fewer inert targets for the enemy to wreck. Had the Navy been given more money before the war, fifty battleships might have been destroyed at Pearl Harbor instead of only five.

If we had had bigger appropriations, our planes still would not have carried more armor, more machine guns and self-sealing tanks. Those prerequisites were lacking because of wrong decisions made arbitrarily by leaders who had little if any idea of what modern air combat requires. The real mistake of Congress and the people was to entrust the formulation of strategy to the wrong specialists.

When the blunders of those who did the planning became grimly evident, Congress, the President, and other civilians meekly shouldered the blame. To put the finger on the real culprits, they believed, would have undermined morale in the armed forces, in the midst of war. Their generosity tended to confirm the mistaken supposition that inadequate funds rather than inadequate military understanding had left America so vulnerable.

A study of the last war proves, I am convinced, that the democratic approach has the great advantage of flexibility. A lively and informed public opinion was able to break through tradition and vested military privileges, forcing indispensable changes and "unfreezing" mistakes. The totalitarian belligerents, by contrast, were stuck with their blunders. The enthroned stupidities of "infallible" leaders could not be challenged.

In a report to the Secretary of War after questioning defeated German military chiefs, I expressed my view that the main reason for Germany's defeat was the regimentation of its military machine. There were no brakes on the intuitions and hunches of the corporal-

dictator, whether it was a question of revamping German air power or invading Russia. This judgment was confirmed in my long interrogation of Marshal Göring. The head of the *Luftwaffe* talked frankly, as one airman to another. The gist of his story was that the myth of an all-knowing *Führer* precluded the creation of strategic air power after the loss of the Battle of Britain had demonstrated the need for it.

Called upon to attack England from the skies, Göring had to attempt strategic bombing with tactical aircraft and was defeated by the superior Royal Air Force. Like nearly all surface-minded war analysts in America, Hitler misread the lesson of that failure. He simply soured on air power and was thereafter chained to the surface.

Hitler was in effect his own Secretary of Defense. He exercised the kind of single authority which some people seek to assign to our own Secretary. Because he staked everything on land warfare, his *Luftwaffe* remained a purely tactical force. The total resources of Germany were mobilized for supreme strength on the ground, with nothing to spare for real air power.

Göring and others who understood this blunder could not appeal to the German people. His efforts to build a real bombing force, Göring told me bitterly, were hopeless. His "beautiful bombing fleet was used up in the miserable role of freight cars carrying shoes, blankets, and mittens to the ground troops."

As he talked, I thought of the immense advantage of our democratic life. We, too, entered the war with the wrong kind of aviation and strategy. We, too, had discounted strategic air power. But the clamor of men at the fronts and air-power experts at home, backed by public opinion, helped to unmask the mistakes. In due time strategy was revised, planes were redesigned; escort aircraft were provided, despite the fact that our Chief of Air Force himself thought them unnecessary. Our high command was obliged to reckon with a groundswell of popular opinion even in time of war. Thus it was not long before the democratic Allies overtook and outdistanced enemy air power.

The kind of centralized power in the strategic sphere which was Germany's undoing may sneak up on us unless we are vigilant. It is reassuring to know that virtually our entire military personnel is aware of this and shares the view I have expressed here. In the midst

of the heated unification dispute, I published a number of articles warning against the dangers of centralized control in the Defense Department. Literally hundreds of letters reached me from high officers of our armed forces not only concurring in but emphasizing the advantages of our system of checks and balances, even in the military sphere.

It is remarkable that men trained in rigid discipline should retain their sensitivity to democratic values. It seems apparent that they are Americans first, military men second. Not only do they not seek a dictatorial role for the military but they would be in the forefront of those resisting any such encroachment.

The American people must understand that in the formulation of a correct strategy in this unique period there can be no genuine compromise. The correct answer cannot be obtained by averaging opposing viewpoints, any more than surgeons, failing to agree on a diagnosis, can settle the issue by operating on some in-between part of the anatomy. A strategy is either right or wrong—and we can't risk being wrong.

Suppose a river is to be crossed and three experts—a tunnel builder, a ship designer, and a bridge specialist—are called in to solve the problem. Each man will honestly insist that his own method of crossing is the most economical and efficient. Being human, he will instinctively react against a solution that would automatically eliminate him from the job. It would make no sense to lock the three experts in a room like a hung jury. There could be no compromise solution, since no single structure can embody the principles of all three systems of river-crossing. A floating bridge dragged by ships through a tunnel would be idiotic.

If the project were left to those experts we would probably wind up with all three: a tunnel, a bridge, and a ferry. But money being limited, the structures would be flimsy and untrustworthy. In the end, those who hired the specialists would have to make the decision themselves. Having heard the three sets of claims, they would order the one construction they deemed most desirable. For this they would not have to be engineers; simple logic, common sense, would be enough.

In strategy, too, the ultimate decision must be made by those who



hire the military experts—the American people. *Once the decision is fixed, all the services can be fitted into it to make it effective.* Only at that point does unified direction, with a direct line of authority, become possible.

In testifying before Congress, General Mark Clark pointed out that real unity and smooth co-operation existed in the fields of operation. General Dwight Eisenhower made the same point in a public address. "I find," he said, "that as you get farther away from Washington it does not seem too difficult for Army, Navy, and Air officers to be friends. I should say that the friendship goes in direct proportion to the distance you get away." Both generals argued, therefore, that a corresponding unity could be enforced in Washington, presumably if the will to be friendly were stronger.

But I fear they are wrong; they confuse tactics with strategy: the tactics in building the bridge, which is the job of men in the field of operation, and the strategic decision whether or not a bridge should be built. In the war which they led, our forces were deployed all over the planet building hundreds of little bridges, little tunnels, little boats. In each particular theater of operation, an appropriate engineer was in charge. Naturally everyone was "friendly" and co-operative; they were simply carrying out strategic decisions made elsewhere.

But in Washington today the problem is to decide *how* the huge gap between two continents will be negotiated. Why expect, let alone command, the competing strategy-engineers to forget differences involving their deepest and most patriotic convictions? In the operational areas, specialists work with given tools and given forces on given limited problems. But in the capital, the tools and forces are only in the incubation stage.

THE PREVAILING ASSUMPTION, in the words of the military "task force" of the Hoover Commission, is that the Unification Act "is on the whole soundly constructed, but is not yet working well,"

I venture to differ. What is needed is a review of the Act—including the amendments of 1949—from scratch. The chief fault of the

law was made explicit, it seems to me, by Admiral D. V. Gallery in a magazine article, though he was quite unconscious that he was doing so. "The type of navy that we need," he wrote, "depends on the roles and missions assigned to the Navy. *These have been clearly set forth in the Unification Law. . . .*" \*

That's what is wrong with the law. It rules out genuine revision of strategy by setting up legal "musts." It is as if a community, in establishing a new hospital, were to prescribe the medicines and surgical procedures to be used. To prescribe roles and missions by law is practically to prohibit thinking on strategy that might make these obsolete.

In its Declaration of Policy, the Act of 1947 calls for "integration" of the three services "into an efficient team of land, sea, and air force." The reference is not to teamwork in any rhetorical sense but in the literal, strategic and tactical sense of roughly equal roles and appropriations.

Teamwork is a great American principle, one of the bedrocks of our social strength. In the sense of sharing responsibilities and co-operating with your fellow-man, it will never lose its value. But in the military area, the teamwork concept, I fear, is being terribly overplayed. The connotation of equality of function—as expressed in the phrase "balanced forces"—is far from reality.

No football coach would insist that no single player make a touchdown until every member of the team has a chance to carry the ball a proportionate number of yards toward the goal. That would not work in football and it will not work in national defense. Instead of the team being justified by the right strategy, we seem to be groping for a compromise strategy to justify the team.

*"In strategy, the time has come to reassign responsibilities. Older members of the team must realize that their greatest contribution may sometimes lie in dignified and patriotic self-restraint—in enabling the most capable member in the modern context to operate with maximum effect."* †

"It would be the height of folly," Mr. Forrestal wrote, "to assume

\* "Don't Let Them Cripple the Navy!," by Rear Admiral D.V. Gallery; *Saturday Evening Post*, October 29, 1949.

† Statement by the author before the President's Air Policy Commission, December 1, 1947.

that a war could be won by any single weapon. If we should ever have to fight a war, I cannot visualize a situation in which one of the services would operate independently. We must have a strong Army, a strong Navy, and a strong Air Force, and we must have them working together in the closest co-operation under all circumstances." \*

In the elementary sense that all forces are likely to take some part in the course of a war, he was right. As right as it would be to declare that modern transportation does not rely exclusively on the automobile, that the horse and the bicycle will be with us in the predictable future. But to insist on "closest co-operation" between speeding automobiles and draft horses "under all circumstances" would be a fallacy as serious as the late Secretary's. To insist that in a possible war between Powers on two continents independent operation by air power is inconceivable, that the three services must work and fight closely together "under all circumstances," is fantastic. And no less so because it is implicit in the present law.

No one has ever claimed seriously that a single *weapon* can bring victory. The possibility under discussion is victory with a single military force, which is quite another thing. Much of the confusion can be traced to the mistake of thinking of the airplane as "a weapon"; it is a *weapon-carrier* which has opened up a new medium for war and has therefore become the basis of a new military force.

That one force, with others in supporting roles, can win wars doesn't need proving. That is how all wars have in fact been won, except the last, for reasons of confusion injected by the emergence of the air element. Those who seek to rest national security on a single military force are referring to a *predominant* force, able to guarantee absolute supremacy in its particular medium. They certainly do not exclude the support of other military elements in the measure dictated by the need. I know of no analysis of all-out air strategy that suggests the "abolishing" of surface forces. The problem is one of cutting them down to size to fit a new pattern of war-making.

But the categorical demand that all services must take part, and impliedly equal part, amounts to a demand that strategic thinking be frozen within the limits of recent experience. Suppose that in the days of cavalry we had an act of Congress providing that the Secre-

\* First Report of the Secretary of Defense, 1948, page 7.

tary of War must weld his army into an efficient team of men and horses. What chance would there have been for the timely development of tanks and other motorized forces which displaced the horse? To prescribe a land-sea-air team today as though it were an eternal institution is no less silly. In retrospect, I would guess, this will seem as weird as if the retention of battleships had been ordered by statute.

It is no accident that an admiral should have cited approvingly the inclusion of "roles and missions" in the Unification Act. It is no longer a secret that the provision for a team and the prescription of certain missions were part of the price exacted by the Navy for going along on unification.

When the program was proposed, the Navy objected, in fear of losing its ancient position of strategic leadership to the Air Force. When finally driven to agree, it stacked the law deliberately so as to prevent such an eventuality. To put the matter bluntly: *because their primary role had been obsoleted by the law of technology, the admirals tried to perpetuate it by bureaucratic law.* This is the principal reason why the law is proving so unwieldy, why so many partisans of the triphibious concepts want centralized power to enforce it, why "blow-ups" like the one staged by the Navy are to be expected as the contradictions between law and reality become manifest.

Let us focus on some of this trouble more specifically. Sections 206 and 207 of the Security Act are parallel provisions defining the Navy and Air Force Departments. The parallel, however, breaks down in one curious and significant respect. Nowhere in the Air section is there any detailed assignment of definite duties, tactics, functions, and missions. The Navy section, by contrast, specifies that this service "shall be generally responsible for naval reconnaissance, anti-submarine warfare, and protection of shipping."

If this referred only to missions to be carried out by surface or under-surface *ships*, there would have been no need to specify. Neither of the other services has ships or could reasonably insist upon building them. Though mention of airplanes is carefully avoided, the assignments would seem obviously to envision the use of *airplanes* for the listed missions. The Navy, before consenting to unification, took the precaution of preserving for itself by law functions in which it might be superseded by the Air Force!

Since the Act specifies that the Navy be responsible for naval reconnaissance, why doesn't it also specify that the Air Force be responsible for air reconnaissance? The answer is obvious. The Navy was seeking to bar the Air Force from air-over-ocean. In effect, artificial frontiers are erected in the sky. It recalls the preposterous Army-Navy agreement of a generation ago under which Army aircraft were forbidden to fly more than three hundred miles beyond the shores.

When planes could not yet span large bodies of water the assignment of these missions to the Navy still made sense—so much sense that it did not require guaranties by law. In a time of global aviation range, tactical iron curtains in the air become an anachronism. We are opening ourselves to the confusions that existed at Pearl Harbor, only this time on a global scale, and prescribed by law. . . .

Shall air reconnaissance be taken over by naval aviation at the coastlines, as in a relay race? Must Air Force planes pursuing or seeking the enemy ask the Navy's permission if the pursuit should extend beyond the shore line? Merely to ask such embarrassing questions is to point up the absurdity of the statutory assignment. Besides, what will the Navy reconnoiter? There will be no hostile navies to speak of, except submarines. Under conditions of global aviation range, the entire air space, over land and water alike, will be infested with enemy aircraft.

If the intent of the Unification Act is to make the Navy a completely self-contained force, then the U.S. Air Force by analogy should be no less self-contained. Much of the efficacy of air defense of the United States will depend on timely radar warning. Since the enemy may approach by sea, should the Air Force maintain its own radar ships at sea, and other ships to protect the radar ships—in the final analysis its own Navy, even as the Navy has its own Air Force?

The Air Force did not of course ask for its own ships. It will rely on the Navy to do the job. The American people have the right to expect the same sort of confidence in the Air Force on the part of the Navy. The Air Force is endowed, not by law but by technology, with the ability to provide the friendly skies under which naval ships can operate in carrying supplies or hunting submarines.

Even the idea that anti-submarine warfare was to remain primarily a naval function is pure make-believe. In the last war the spotting of



subs and their destruction was in large part carried out by land-based aviation; and air offensive against the sources of submarines in enemy territory became increasingly the first line of defense against under-seas craft.

It requires no law to assure the Navy of control of submarine chasers and other ships; but no law can give it a prior or exclusive role in anti-submarine air operations. The same holds true for "protection of ships." Insofar as the protection is provided by other ships, or by planes designed to enhance the efficiency of such ships, it is naturally a naval job. But ships have already been largely superseded by planes in this job; transoceanic range tends to make the shielding of sea traffic entirely an Air Force mission. To insist by law that these planes be naval is to turn back the clock of history.

This effort of the Navy to enhance its importance by legalistic gambits is bound to fail, because it is in conflict with the technological facts. Unification predicated on a deal to perpetuate the outlived roles of any service is bound to fail. The Security Act must be revised to permit the revolution in strategy dictated by history.

PRESERVATION OF THE MARINE CORPS *as a naval arm* is another legalistic absurdity. In reality it serves to minimize the usefulness of that arm by tying it into the vanishing functions of the Navy.

The law provides, for example, that this Corps serve with the fleet "in the seizure and defense of advanced naval bases." But an infinitely more vital job today is the seizure of advanced air bases, and not necessarily by surface fleets. The most significant "beachheads" of tomorrow are unlikely to be on coastlines, for war will be carried directly to the heart of the enemy nation.

Invasion in the future is more likely to begin at the center of the enemy area than on its periphery. It will be an air operation, as naturally under the aegis of the Air Force as the landing of Marines on Tarawa was a naval operation. The Air Force therefore should have its own air-borne corps for the undertaking—which would be available if the Marine Corps were reorganized and expanded on a truly triphibious basis.

Why limit and waste our Marine Corps—product of many generations of superb courage, organization, and spirit; product of our noblest military traditions—by making it eternally dependent on ships?

The Marines have been America's shock troops, its spearhead in seizing difficult forward positions. Whatever course strategy may take, we shall still need that kind of spearhead. We shall need the courage that has endeared the Marines to the nation. But it should be a Corps capable of exerting its force wherever it is required, not only on beaches. It should be a truly triphibious shock regiment, equally at home on land, at sea, or in the air; equally effective whether landed on the edge of an enemy area or in the heart of the enemy country.

In the past the Marine spearhead could be projected across distance only by ships; it was a natural extension of naval power. In the air age our shock troops can be projected more quickly, more efficiently, through the skies. The link that ties the Marines to surface fleets must be cut if the Corps is to be saved from withering away.

I am convinced that the Marine Corps will ultimately have to be given wings and freed from the restraints of the outlived naval pattern. Why handcuff this great fighting force to landing craft by water in an era when the paramount medium of transport is the air? As long as war has not been banished from this globe, we shall need the Marine Corps—not as a museum piece of past glories but as a vital arm of future achievement.

And for this it must be converted into an *Aeromarine Corps* (though the name is not important), set into the pattern of the defense establishment as a spearhead shocktroop Corps on call for all the services. It will then have the same relation to paratroopers that it had in the past to soldiers; it will be a superb striking arm not of surface fleets but of all our fighting forces. This would not mean the "abolition" of the Corps but its release for greater, more realistic, and more vital service. To allow the Corps to remain an adjunct of the Navy would amount, indeed, to its slow abolition.

IN THE PROPAGANDA for centralizing strategic authority the accent has been on economy. Obviously everybody is against extravagance, just as everybody is against sin. But in the military domain true economy is not achieved by paring here and there, advisable as that may be. *True economy is inseparable from correct strategy.* If the entire program is based on the retention of superfluous weapons and forces, minor savings through efficient housekeeping become futile.

Suppose you live on a lakefront, but must do your shopping in a village a few miles down the shore. You maintain a horse, a car, and a boat. Suddenly you are obliged to economize. Would it not be silly to underfeed your horse, keep your boat leaky, and cut down on oil for the car? Would it not be more sensible to maintain only one means of transport—the one you judge most efficient—in perfect order?

To solve the problem of intolerable security costs, the American people must choose the decisive instrument of victory and channel their available resources into it. Efficiency may save us millions—but a streamlined strategy that eliminates outlived weapons and methods can save *billions*.

In testifying before the House Armed Services Committee, General Marshall declared that the whole trouble was in the lack of funds. Rarely has a truism come from a more exalted quarter. Unquestionably all “bickering” would cease forthwith if we could let the three services have sufficient money to make each of them capable of winning a war by its own strength. The essence of our current plight is that in relation to our probable adversary we have become in many respects a have-not nation. Our problem is to provide an adequate defense *within our means*. If we build up the *wrong* forces, we must pay for the error by cutting down on *right* forces.

To facilitate a decision, the Security Act should be amended to eliminate even the hint of any specific strategy through prescribed roles and missions, and permit uninhibited change. Each service should be able to present its case without inhibitions or interference. The central issue of strategy for victory will then be decided, like all vital issues in our republic, by democratic methods. Crucial differ-

ences will be brought into the open, instead of being concealed or stifled.

Most airmen, convinced that the triumph of the concept of air-power strategy is inevitable in any case, welcome open competition of ideas. That, they feel, will hasten its acceptance. The attempts to hide strategic conflicts, to make them an inside family affair, have come from the diehards who, consciously or otherwise, want to evade popular intervention on the issues.

Outwardly, it would seem at this writing that a *modus vivendi* has been worked out. Lip service to unification comes from all official quarters. General Bradley has even retreated somewhat, at least verbally, from the ironclad concept of "balanced forces." But the fact remains that the contest for strategic roles continues; that each service seeks the largest possible appropriation to increase its relative strategic weight.

First, we are formally apprised by the Joint Chiefs of Staff that strategic air warfare is "sound" and the B-36 is its valid instrument.

Then, after the Exercise Swarmer maneuvers, the public is notified that the Army's "strategic airlift" must be extended. This, plus the flamboyant claims for "wonder weapons" that followed, represent the Army bid for a primary strategic role.

Finally, the Navy renews its claim to a primary strategic role. Following the dramatic cancellation of the supercarrier, the Chief of Naval Operations who staked his career on this ship was dismissed and a new one, presumably reconciled to curtailment of the function implied by the cancellation, took his place. But the dust had barely settled when the public learned that the supposedly defunct carrier was being resuscitated.

Avoiding any reference to strategy, Admiral Sherman explained to Congress that he needed larger carriers (though not as large as the supercarrier) for the safe operation of jet planes. It happens, however, that a deck long enough for the take-off of jets without help of rockets or after-burners is also long enough to accommodate any type of strategic aircraft. And indeed, soon thereafter it was disclosed that the Navy was organizing two A-Bomb Squadrons to "hit almost any spot on earth," as the press reported. In short, we are back where

we started, with the Navy in a primary strategic role. Even the battleship is being slated for resurrection in the form of a guided-missile ship to protect carriers. Admiral Sherman disclosed the intention, as a starter, to convert a 13,700-ton cruiser into a guided-missile ship at a cost of \$40,000,000.

Under the beguiling surface of interdepartmental peace we are thus proceeding to create three separate strategic forces, each demanding the largest possible share of our security potential—which amounts to a guarantee that none of them will attain the magnitude and concentration for victory. On the basis of mutual accommodation and backscratching, with little if any reference to real strategic imperatives, the services around the family table tend to divide the defense pie into three segments as equally and “fairly” as possible. We are well on the road to bankruptcy through confusion.

The creation of a unified military establishment in 1947, leaving the three services autonomous, was a step in the right direction—primarily because it put the Air Force on a basis of parity with the Army and Navy. Without such equality there could be no hope of acquiring proper and adequate air force. With all its faults, unification was preferable to continued subordination of the Air Force to the surface services. Had aviation leaders refused the Navy’s terms they might still have been subordinate officers in the Army. They have at least won the chance to make their own plans and defend them before the court of democratic opinion.

However, the military establishment, after the passage of the 1949 amendments, is incredibly complicated and unwieldy. In this it reflects the conflicts and confusions in this transitional stage of the search for strategic “answers.” The very use of terms is jumbled: the civilian Defense Secretary is given a “deputy,” which is a military designation, whereas the Joint Chiefs of Staff are given a “chairman,” which is a title in mufti. Moreover, the creation of this position of chairman, without the right to vote, implies a peacemaker and conciliator among competing strategies, rather than the military head of a well-defined strategic concept for national security.

The fact of the matter is that the present so-called unification is neither flesh, fish, nor fowl, and will never project a single strategy



for victory. Either we have three autonomous co-operating departments—or we have one genuinely integrated department of one military force in conformity with one definite strategy.

Meanwhile, there is little comfort or help in being informed, as General Marshall informed us, that everything would be easy if we had unlimited money. Nor in an announcement, such as General Eisenhower made on October 20, 1949, that he would not “take sides” in the interservice struggle—the most fateful controversy of our time. A confused and anguished Congress had turned hopefully to General Eisenhower for definite guidance, but received instead a high-minded sermon on the virtues of unity and good will. Lectures on faith and fortitude have their place and time, but they are not useful when the patient needs an abdominal operation. The country, I think, is tired of fence-sitting. The security problem is too urgent for polite political formulas.

This is a critical time—a time for clean-cut and valorous recommendations without face-saving for the past or hedging for the future. Straddling is a luxury for easier times. In this fateful period the American spirit must be rallied by bold, outspoken, uncompromising leadership. And this goes not only for military affairs but for the political and economic areas as well. We cannot evade the challenge of a world riven in two.

When the people, having weighed all the pertinent facts, decide what the strategy shall be, the organizational setup will once again have to be revamped. If air force is recognized as the first line of defense and the only self-sustained strategic force, the establishment will ultimately have to be brought into alignment with this fact.

In place of an innocuous chairman, the Joint Chiefs of Staff will then be headed by a true military chief, vested with power of decision. His strategic ideology will permeate the armed forces—and he will, of necessity, be an airman. Then genuine integration, singleness of purpose, and unity of command will be achieved. The extraordinary power now vested in the Secretary of Defense will become superfluous. He will be essentially a civilian administrator, the personification of civilian control over the military.

The central question before America today is whether it will be primarily a land-, sea-, or air-power nation. It cannot be all three at

the same time. The question, in the nature of the case, cannot be answered by admirals, ground generals, or airmen. A breed of military men unaffected by service bias may someday emerge. But its evolution will require at least a generation. In the meantime, the people must make the decision.

When the nation decides that its predominant reliance must be on air power, then unification will not require drastic policing. It will follow naturally and almost automatically. I am convinced that the American people, and in particular American youth, are ready for that clear-headed and courageous commitment.

## AMERICA INVINCIBLE

## 1

THE PRINCIPLES of war-making are immutable, however much the methods may change. Technical advances have repeatedly recast the patterns of human conflict. Yet the principle of surprise, of economy or preponderance of force, and other fundamentals remained constant.

A basic law, as valid in our time as ever in the past, is that war must be geared to one primary force. Depending on its geography, a nation seeks clear-cut superiority in a single medium, looking toward a decisive battle that will confirm its mastery there. Other elements of support are provided—but never at the expense of the main force in the decisive medium.

The law accords with common sense. It dictates a focusing of resources and effort in the crucial strategic dimensions, instead of frittering away strength on secondary objectives. Until our own generation, this classic axiom of the art of war was not seriously questioned. Warring nations aimed at invincibility on land *or* at sea. Every American strategist knew we could not be equally strong in both. Because of our insular position, the role of the Navy was accepted as supreme; it guaranteed security for the homeland and time for providing land force if necessary.

Absolute dominance in one medium—that is the essence of true *strategic balance*. The mechanical division of national wealth among all military elements, which nowadays passes for “balanced forces,” is in truth wasteful unbalance, a surrender to confusion.

The classic principle of a single predominant force was sadly obscured in the last war. Never before had a great struggle been attuned to a “team.” Even through the confusions of World War II, however, the classic concept can be discerned. In Europe, the foot soldier was

the fundamental force, with everything else in supporting roles. In the Pacific, strategy was naval in concept, aiming to blockade and strangle an insular adversary.

The team, indeed, had not been planned in advance but evolved under fire to meet unprecedented situations. The insular Powers—Britain, Japan, the United States—were prepared primarily for naval warfare; the continental Powers—Germany and Russia—for land warfare. Their underlying plans and expectations were upset by the opening of an entirely new medium, the air, as an arena of contest.

The old forces were obsolescent—but the new had not yet attained full stature. The skies had become the most efficient medium for carrying war to an enemy—but the equipment for the purpose had not yet matured. As a result the world witnessed a war of unlimited improvisations and confusions. The team emerged as the product of the *transition period*. It was a historical bridge, a makeshift that would lose all meaning as soon as air power became as decisive in its own sphere as armies had been on the ground and navies on water.

Since then air power has come of age. It has acquired the range to strike at any target on the face of the earth from its home base; to accept battle anywhere regardless of distance. The transition period is therefore ended. To perpetuate the makeshifts and confusions imposed by the transitory conditions makes little sense.

The classic principle of a single invincible force in the dominant medium must again be reckoned with. It can be ignored only at the risk of dissipating strength in irrelevant preparations. What has been urged in this book is neither far-fetched nor, as military doctrine, even "novel." It is in effect a return to strategic sanity, to an orderly and established war-making concept—but applied to the third dimension.

Even naval enthusiasts no longer regard sea power as primary. At most they demand "equality," which is a political rather than a military notion. Concentration on land forces, as we have seen, is for us physically impossible and in any case would give Soviet Russia every advantage of position and numbers. As for air force dependent on bases close to the hostile heartland, that would again amount to reliance on the surface force we cannot muster.

The logic of these facts is inexorable. Control of the entire air ocean must now be the paramount objective of war between nations on dif-

ferent continents. It is the indispensable condition for victory. We have no real choice but to channel our resources into the air, even at the sacrifice of strength on the surface.

Our strategy must again look to the *classic decisive battle*, which will now be fought in the air. We must prepare to sweep the enemy out of the skies and take complete mastery of the air space.

All armed forces must concentrate on that supreme battle, aware that survival depends on the outcome. Bringing to the task a unity of spirit and conduct demanded by the new reality, not by law, they must constitute an unbeatable team in the moral sense.

We must renounce misguided counsels of simultaneous superiority in all elements. Our goal must be simple and unambiguous: a dominance in the air as clear, as incontrovertible, as Britain's used to be on the high seas at the zenith of its power.

This is not, as misinterpreters of the air-power thesis keep repeating, "an easy answer to the perfectly natural human desire to win wars without fighting." No such absurd claim has ever been advanced by airmen. Theirs is not the "easy answer" but the *only* answer!

The expectations of myriad battles on land, at sea, and in the air is a carry-over from the confusions of the last conflict. It is our Maginot Line delusion. Every war in history has moved toward a decisive battle; in the next war it will be the battle that gives one side or the other control of the air ocean.

Do we have the time to undertake a reorientation of the national security program for invincibility in the new medium? The answer is that the time element is not more favorable to us in triphibious strategy. After all, it takes no longer to build a proper air force than an improper one plus a great army and navy.

The construction of supercarriers is, if anything, a slower process than the construction of super-battleplanes. Creation of titanic land power to match the Kremlin's, plus the massive air auxiliaries this connotes, would be a far slower and more formidable job than the creation of the necessary intercontinental air force. It *seems* easier and faster only because we are familiar with the process.

But we must begin now. Time works against us. While we flounder strategically, building anything and everything almost at random, Russia is amassing and consolidating its strength. We must adopt the



correct strategy without delay, so that it can achieve superiority before Russia can be ready to strike. This time we are not likely to be given the time to switch strategies after the folly of wrong concepts has become apparent.

The terrific strains of modern total war, if it comes, will bring censorship and regimentations beyond any we have known in the past. The kind of democratic criticism which in the last war forced vital revisions in the midst of the conflict may be curtailed. Those in command of erroneous strategy may proceed to carry it out to the bitter end. In the atmosphere of war, the initial skirmishes on the enemy's periphery will look to them, and to the public as well, like the real thing. They will therefore hasten to commit our whole national potential to winning those inconclusive preliminary tests, leaving nothing for the conclusive interhemispheric struggle yet to come.\* That is why the great decision, lifting war into the third dimension, has to be made now. Time is running out.

Those who will not or cannot grasp the significance of air power persist in treating the airplane as a *weapon*, thus putting it in the same category as an arrow, a gun, a torpedo. War, they argue, should not be staked on a single weapon.

Their fallacy flows from failure to understand that the airplane is a *carrier of weapons*, a vehicle; its relation to air power is precisely the same as that of ships to sea power. It is a new form of transportation, making a new medium accessible as a theater of warfare for the first

\* Startling proof of this danger is provided by the Korean events. That local skirmish between contiguous land areas began simply as a surface contest for occupation, in which the function of aviation was tactical, intended to isolate and interdict the North Korean army. *The Korean picture is wholly irrelevant to a war between Great Powers on different continents.* It will remain irrelevant as long as it is localized. Military and civilian commentators alike, however, rushed to the utterly false conclusion that America must generate colossal surface forces in line with the Korean experience. Secretary of the Army Frank Pace, Jr., for instance, declared on June 30, 1950: "In the event that a full scale aggression should be thrust upon us, it is obvious then, that any truly major war in which we might become involved in the foreseeable future, would be a full scale ground war," and therefore, "that we gear our defense forces to fight this type of war." His conclusion is erroneous. If the Korean episode should lead to a general conflagration, we could not possibly provide the tremendous surface forces to cope with an Asiatic coalition which can draw on a manpower pool of 600,000,000 people, not counting the USSR. Our position in Korea would become untenable. The same would hold true for any other part of the hostile Eurasian continent.

time in history. We are not dealing with a weapon but with a military force. Not only can wars be won with a single military force but (the confusions of World War II notwithstanding) that is how wars have always been won.

As long as the airplane lacked independence of operation it was, of course, a weapon. For armies and navies alike, it constituted a new type of artillery. Naval aircraft, conveyed by ships to the scene of action, were the weapons of sea power. But airplanes, with the range for operation anywhere in the air space enveloping the globe, are the vehicles of a new military force, with its own laws and tactics and strategy.

The nature of the medium, moreover, makes air power the *supreme* strategic force. It enjoys complete initiative of action over land and over sea, for it can make contact with forces below and break contact at will. The land and sea forces have lost that initiative. Their position is purely defensive; they can attempt to repel attack from overhead but cannot undertake attacks against air power.

These elementary considerations are emphasized again in this concluding chapter because they are basic to a clear-headed grasp of the new military equation. That equation holds true regardless of progress in weapons, since these will enhance the forces in all three mediums; it holds true whether atomic destruction is carried in bombs, shells, bullets, or B-B shots. The verdict in the contest for control of the air space comes first and cannot be appealed by surface strength, no matter how powerful. The decisive battle, the Trafalgar or Waterloo of the next war, will be fought in the air.

AMERICAN TECHNOLOGICAL SUPERIORITY is a value that must be continually and consciously safeguarded. In the air age it is the core of our advantage and its wellhead, we know, is in our free civilization. The more scientific and industrial distance we put between the Sovietized segment of humanity and ourselves, the less chance there will be of war and the greater the likelihood of victory should war be forced upon us.

The paradox of modern technology is this: its *creation* calls for

specialized brains and talents of a high order, but its *use* is open to nearly everybody. A child can run a modern push-button elevator, where the crude elevator of the past called for a trained operator. Anyone can pull the trigger of a gun fashioned by top engineers. As technology advances, automatic processes are substituted for human intelligence.

Thus the mechanics of mass demolition, brought into being by the most highly developed nations, can be taken over and misused by the most backward, with hundreds of millions of robots at their disposal and no civilized restraints to inhibit their use of the most terrible engines of destruction. Japan contributed practically nothing to the development of the equipment of modern war-making which it turned against those who developed it.

In ordinary self-defense, therefore, we ought to impose an absolute quarantine on the totalitarian portion of the world in the matter of advanced technics and science. Thus far Russia has lived a parasitical existence. It has bought or stolen the industrial treasures of the Western mind from their creators. It has absorbed technology through a one-way valve—getting everything and returning nothing, not even its improvements on “borrowed” technical knowledge. From this point forward, Communism should be obliged to live on its own intellectual capital.

Its material resources are equal to our own and its manpower greater; its social system, Soviet propagandists claim, is superior to ours. Can it catch up with and surpass the free world? The test will be provided only if Communism is denied the privilege of rifling our intellectual larders. It may be that an isolated totalitarian sphere can outdistance us. In that case it will have demonstrated its superiority and the doom of our type of society will be in the cards. But there is no excuse for deliberately stacking the deck against ourselves.

We can safely throw down the challenge of *genuine* competition between the two worlds. Having a profound confidence in the advantages of our way of life, our concepts of personal liberty, our moral codes and spiritual commitments, we must say in effect:

“You cannot have the benefits of our achievements while opposing and excluding the cultural and spiritual values from which, in our view, these achievements flow. Our technology is available to peoples

everywhere but only as part and parcel of the freedoms and decencies we cherish."

This decidedly does not mean that we "underrate the Russians." The widespread delusions about Hitler's supposed weakness are fresh in memory. Eminent fuel authorities, for instance, stated without reservations that Germany could not go to war because its fuel reserves would be exhausted in three months.\* But when the chips were down we learned that Germany was far better prepared than we had supposed. Similar assurances today that Russia cannot go to war, because of debilitation in the last struggle or because of inadequate strategic materials, should be taken with great caution. If err we must, let it be in the direction of over- rather than underestimation of the Soviet potentials.

At the same time, however, the inherent faults of a police-state, which showed up in Germany, can be expected to show up in Russia. A sensible quarantine would tend to expose the clay feet of the Communist colossus more quickly. In extending technical assistance to backward nations, we should make it air-tight and leak-proof, so that none of the products of our civilization finds its way to a hostile arsenal.

One indubitable advantage on the Soviet side is in the realm of subversive warfare—especially now, before the outbreak of war. The reference is not to wrecked bridges, dynamited factories, and the like. This kind of sabotage is more of a nuisance than a threat. It never wins wars. The more subtle and more dangerous subversion takes the form of propaganda that helps commit a nation to faulty military preparations.

In prewar France, all the overt Nazi efforts put together were not half as pernicious as the preachments of false military doctrines. This was what led the country to lock its wealth into a Maginot type of security. And by now it is clear enough that there was malice as well as muddle behind that propaganda. Wrong military decisions were helped along by pro-German elements in key places. Obviously, we

\* At the same time we seriously underestimated our own gasoline needs, in line with the failure of our High Command to foresee the magnitude of the role of air power. See letter from Paul M. Raigorodsky, Assistant Director of Petroleum Administration for War, in Appendix.

must fortify our intelligence services, so that we shall not be helpless in the face of deceptive propaganda. After all, when Moscow announces that it is building hundreds of submarines or a huge surface fleet, we are under no compulsion to accept that at face value, or to hasten to drain our resources to meet the challenge.

I do not for a moment question the complete good faith of those in our country who today labor to tie the United States to outlived and economically dangerous military blueprints. Like the great majority of the Maginot Line adherents in France, they are fully convinced of the validity of their views.

Yet it seems to me that Communist propaganda, having failed to steer America onto the path of complacent pacifism, will increasingly support the most profligate and unrealistic military planning. Moscow can no longer prevent us from seeing to our security. But it can make every effort to encourage us to spread our limited resources over as large an area as possible, by building the largest armies, navies, and air forces at the same time.

What Moscow fears most is direct offensive through the skies. We should expect, therefore, that its agents and dupes will do their utmost to head off that kind of strategy. It was Lenin who said that America must be driven to spend itself into bankruptcy.

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THE MANIFEST DESTINY of the United States is in the skies. We must attain a superiority in the air that can be as great a force for world peace as Britain's superiority on the seas in its day. To that purpose the American people must assign top priority on their wealth and manpower and inventive energies. They must remove any provisions in the law or in military institutions which chain the country to outmoded strategy.

The decision is not an easy one. It cuts across habit, inertia, a variety of vested interests. It calls for a bold intellectual commitment. All the pressures of enshrined military prestige are, as always, on the side of "proven" strategy, which just now means the threefold land-sea-air warfare of World War II.

"Who are we in the Senate," one of its able members, Millard



Tydings, exclaimed recently, "to say that a man of the pre-eminent leadership of General Bradley, who already has proven his capacity on the battlefield, is wrong?"

Though we all share his admiration for Bradley's accomplishments, this seemed an echo of voices in the French Chamber of Deputies in the aftermath of World War I, when the Camelins and Pétaíns and Foches, in full military regalia and decorations, demanded support of their concepts of trench warfare. French Senators, too, were overawed by the reputations of national heroes who had "proven their capacity on the battlefield." A revolution in strategy is never popular in a victorious country. Its thinking and its industrial setup alike are in deep grooves. As long as military ideas can be held within the bounds of orthodoxy, there is a minimum need for retooling industry or retooling the national mentality.

The great change advocated here can come only through a groundswell of public opinion strong enough to breach the dams of vested interest and mental inertia alike. Happily our system of freedom makes this possible. The very fact that a book like this one can be published, though it runs counter to official views, should be a matter of pride to all Americans.

I join in the great respect in which all Americans hold the architects of victory in the last struggle. But I contend, nevertheless, that the new military situation calls for new leadership. Those raised in the traditions of surface warfare are literally incapable of making or implementing the inescapable change-over to air strategy. Military concepts are not put on and taken off like different garments for different climates. They are the products of a lifetime of education and experience, expressing deep-rooted military philosophy.

As patriots, old-style military strategists cannot refuse the burden of planning when it is loaded on their shoulders. But to ask such men, no matter how noble and brilliant they may be, to jettison-lifelong habits of thought is not fair to them—and can be fatal to the security of the nation.

The costly blunders of the last war, beginning with the Pearl Harbor disaster, were not due to lack of intelligence or devotion. They were the result of faulty ideas—honestly come by, honestly defended, but wholly unsuited to the conditions of the air age. Air strategy can-

not be formulated and carried out effectively by surface-minded thinkers. Not because they are unwilling, but because it calls for competence in a totally new art of war-making.

If such men fail, as fail they must, the fault will not be theirs but ours. When you put into the hands of a specialist a task completely outside his field, you must be held responsible for the results. Once again there is reason to fear that the President and Congress are becoming the prisoners of a military group wedded to obsolete ideas, and it is up to the people to release them from this intellectual bondage.\*

Fortunately our country has in its service a generation of superb airmen, matured and tempered for the strategic job to be done. They have the experience of two World Wars under their belts.

In the postwar years, on the assumption that "flying is a young man's game," most of the elder echelon of our Air Force has been sloughed off. *Fighting* is a young man's game in any medium. But creative strategic thinking is the province of mature minds; age has little to do with it.† There is still an unfortunate tendency to regard airmen as "juniors" in the military family, though many of them belong in the age groups of our top admirals and generals, with military backgrounds as broad and as intensive.

Our airmen are completely at home in the era of air power. Their minds and training and psychological commitments are in tune with the new conditions. The American people can entrust their military destinies to such men without misgivings.

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THIS BOOK began with a number of premises which, I trust, have been justified. The first was that our present strategy, in effect a repetition

\* Further proof of this condition was provided by President Truman in a press conference on June 22, 1950. Explaining his decision not to increase air force strength, he said that such an increase "could have a serious effect on our ability to maintain balanced military forces in subsequent years." Obviously, he was reflecting the commitment of the Joint Chiefs of Staff to "balance" land-sea-air strategy.

† Winston Churchill, young at seventy-five, had the wisdom to attest, in his M.I.T. address on March 31, 1949: "... Air mastery is today the supreme expression of military power, and fleets and armies, however necessary, must accept a subordinate rank."

of the land-sea-air warfare of the last war, is wrong and beyond our economic and manpower capacities in any event. The second was that a correct strategy, aiming at global command of the entire air space, is now possible and within our capacity. The third was that this strategy, if adopted *in time*, is likely to head off war—by making it obvious to would-be aggressors that resort to force would be suicidal for them.

We have seen that the triphibious team was a transitory device. It was improvised to meet the emergency of a highly temporary set of conditions that will never recur. With the achievement of intercontinental air range, the emergency has been liquidated and the strategy it called for has been relegated to history.

The entire design of present preparations, resting on an empire of scattered bases, is therefore doomed to failure. Local command of the sky over a limited area has become impossible, so that bases, sources of strategic materials, and ports within the reach of an enemy's major aerial forces can no longer be held. Floating bases—aircraft carriers—cannot approach a hostile mainland possessing air force-in-being, and are therefore little more than relics of a completed stage in the annals of aeronautics.

Our people should realize that when billions are poured into naval aviation, it does not enhance our air power. On the contrary, it draws off wealth from real air power and in addition freezes a large chunk of aeronautical productive capacity. We may find ourselves unable to retool that segment for aircraft of genuine aerial warfare, just as Göring, by his own account, was unable to switch to strategic bombers after the *Luftwaffe* failure over England.

In short, appropriations for naval aviation reduce our chances of winning the air battle that will fix the outcome of any coming war. Only the fraction still applicable against submarines will be useful; the rest is plain waste. Though naval leaders continue to talk about it, there is simply no such animal as "sea air power." The breed is extinct. The air ocean is one and indivisible, its conquest the task of the Air Force. Therefore the entire air potential of the country must be unified in a single air command under the Chief of Air Staff.

Before the last war, on June 7, 1938, I wrote to Louis A. Johnson, then Assistant Secretary of War, that "the possession of an adequate number of airplanes at the outbreak of hostilities is of importance.

The deciding factor thereafter will be the ability of the nation to produce aircraft on an adequate scale which is greater than that of the adversary." But in the next war that may not hold true. The conflict may be resolved by forces "in being" and we cannot physically maintain more than *one* force of the magnitude for victory, fully alert for instantaneous action, if we are to remain an unregimented people.

The average American is deeply impressed with the prodigious industrial capacity of this country. He remembers vividly how in the last war we buried our enemies under an avalanche of industrial output. He knows, moreover, that since then American productivity has gathered even greater momentum. As a result he does not easily grasp our critical situation in the looming struggle against the U.S.S.R.

He needs to consider that *a titanic mass of weapons calls for a titanic mass of men to wield them*. In World War II we had that. We were able to mobilize almost half the human race—about a billion people—against the quite limited manpower of Germany and Japan. Our industrial abundance and profusion therefore found logical application.

But in any genuine world war tomorrow, this relationship will be reversed. The billion men will be on the enemy's side. Our industrial outpour will be in vain, because we simply will not have enough hands to wield a super-abundance of weapons. That is why we must change our basic war-making concepts. Whereas in the last war our emphasis was on quantity, often in disregard of quality, our accent hereafter must be on quality—channeled into the medium where the enemy cannot exploit his vast numerical superiority. Only in the air ocean can we apply General Forrest's hallowed principle, to "git thar fustest with the mostest."

We must stop the anachronistic habit of dividing our defense appropriations into roughly three equal parts. With the Air Force our first line of defense and its action decisive, at least two-thirds of our national-defense effort must go to the Air Force. Only powerful continental air force can save American civilization from destruction by atomic and other bombing. Only the deterrent of American long-range striking air power, operating directly from our shores, can shield any effort to rearm and revitalize Europe. Only air power can pro-

vide an effective answer to a submarine menace. Only under friendly skies guaranteed by air power can our Navy and naval transport carry out their functions. Above all, only through the air can we marshal a force, superior both in equipment and numbers, for a genuine offensive to destroy the enemy war potential at its source—thus preventing air attacks on America and disarming the teeming Communist hordes.

In the light of these military facts, it seems to me, we must not assign a single billion dollars for defense on the surface, or for bolstering allied strength, unless we are prepared simultaneously to channel *two billions* into the United States Air Force. For that force is the heart and core of security for ourselves and other freedom-loving peoples.

Invasion of a hostile continent is precluded until its defensive air power has been neutralized or eliminated. That can be accomplished only through air combat sustained in part from the British Isles, but primarily from our own hemisphere.

Soviet Russia, because it is condemned to channel its major potentials into invincible surface force, cannot at this stage also provide air power capable of winning an interhemispheric air war. Its main strength is—and must remain—on the ground. There we have neither the manpower nor the economic potentials to match it. Even if we could generate armies of the necessary size, we could not land them or transport them to the battlefields before the enemy was denuded of his air strength. But when he is thus denuded, there is no longer any need for mile-by-mile surface struggle. We have no alternative but to *by-pass Russian ground forces through the skies*.

We cannot do this, of course, as long as we are pledged, in defiance of realism and logic, to contain Communist aggression by force along its entire vast Eurasian periphery. Somehow we must find the political wisdom and military good sense to withdraw from peripheral points which can be swallowed by Red ground forces—except where local peoples have both the capacity and the will to fight with us for freedom and decency to the bitter end. Somehow we must begin without further vacillation to consolidate our position in order to effect economy of force—in preparation for instantaneous offensive through the skies.



Such sensible policy would immediately and sharply cut down the demands for almost infinite quantities of ships, tanks, carriers, tactical planes and foot soldiers. Under the old triphibious concepts, those demands will clog our industry, exhaust our resources and drain our limited reservoir of manpower. But we have to free our industrial capacity for the supreme task of forging the weapons of victory. Unless we clear the decks for intercontinental air action, we shall be the captives of confusion: grinding out more and more obsolete weapons for an exorbitant worldwide surface strategy that promises only colossal losses climaxed by defeat.

When this is understood, the fallacy of the kind of universal military training now being urged becomes apparent. Why train millions of young people in the ancient arts of the bayonet and deck-scrubbing? Before deciding the problem of universal service, we should put our strategic household in order: otherwise only harm and waste of effort can result.

Occupation of the defeated areas after our victory is sometimes cited as a pretext for building up immense armies. But that is unrealistic. To occupy the great Eurasian continent, with its billion inhabitants, in the manner we today occupy Japan would be a hopeless enterprise. If all Americans of military age were put into uniform they would not suffice for that assignment. If we are called upon to impose our will on populations after the victory, it will continue to be done through the threat of force from overhead. If necessary, limited streamlined air-borne forces could be landed, their effectiveness guaranteed by air power.

Our country passionately desires peace. The principal test of any proposed security program must be its likelihood of acting as an effective deterrent to aggressors. But we prefer war to subjugation, the horrors of conflict to the horrors of totalitarian slavery. America has not only high ideals to set against the pretensions of Communism—it has the will to fight for those ideals if necessary.

Communications and transportation have shrunk this planet to such a degree that the permanent co-existence of two violently opposed social and moral systems has become difficult if not impossible. Either one ideology will succumb to the other through persuasion, infiltration, and contamination—or a military showdown will become un-

avoidable. But whatever history has in store, humanity must one day achieve a world under law, when the universal disarmament of which all decent men dream will be a fact. Until then, while striving for peace, we must prepare for victory if the peace is broken.

We believe in the basic superiority of our way of life. We are convinced that the tyrannized peoples of the Soviet sphere will not forever endure the ignominy of their enslavement. The processes of inner weakening, for all we know, have gone further than the outside world suspects. In short, we count on the ultimate supremacy of our ideology without the cataclysm of war.

But because we cannot close our eyes to the alternative, we must have a military program that will insure victory without undermining the free political and economic institutions which to us spell America.

Only an invincible Air Force that can take command of the entire air ocean, lifting the struggle to the highest technological level, holds that assurance. Those who share this conviction have a duty to perform. It is to hammer away day and night, despite setbacks and scorn, on the mind and conscience of the American people. We have what it takes to forge the weapons of victory and of lasting peace. The decision rests with the American people. Nothing less than human freedom, for ourselves and all mankind, is at stake.

In this era, when force is still the final arbiter and when devastating explosives have been unleashed by science, the contest for mastery of the medium through which destruction is carried becomes paramount. Air power is the key to survival.

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## APPENDIX

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[PAGE 8] *Letter to the editor of Skyways magazine, written by Rear Admiral B. Doudoroff, Major de Seversky's commanding officer during World War I, in reply to the article by Major General Malone. December 29, 1942.*

Dear Sir:

In a recent issue of your magazine Major General Paul B. Malone attacks the author of "Victory Through Air Power," Major Alexander de Seversky. I do not propose to discuss the strategical or organizational views expressed in the general's article. Anyone has the right to accept or dispute Seversky's ideas on the strategical predominance of the Air Force, or on its proper organization. But this does not give anyone the right to doubt the sincerity of Major Seversky's intentions or to make disparaging remarks about Major Seversky's war record or his basis for speaking with authority on matters of military aviation.

The writer of this letter was a Rear Admiral in the Russian Navy. From 1912 till the spring of 1917, I was in command of the Naval Aviation of the Baltic Sea, and then I became the Technical Head of the Navy Department (Vice-Minister of the Navy) in the Provisional Russian Government headed by A. F. Kerensky. In this last capacity I was in charge of the Naval General Staff and Bureau of Personnel. The record and services of Seversky during World War I are therefore well known to me. I must take vigorous exception to General Malone's slurs in this respect.

Having completed both general and advanced courses of Naval Aviation, Seversky, in 1915, joined the Naval Aviation of the Baltic Sea and was appointed to the Second Air Station on Oesel Island, which happened to be the most active sector and one to which only the best officers were usually assigned. Naval reconnaissance, bombing operations as well as combat actions with the German planes were the daily routine of the Air Force based on this station, and Second Lieutenant Seversky proved to be one of the most enterprising and gallant of its members.

Unfortunately, on July 2nd of that year, during a bombing expedition, he lost his right leg, and the observer of his sea-plane was killed. Far from concluding his aviation service record with this severe injury, *Seversky was at that time only on the threshold of his military career.* After his recovery he was placed at the disposal of the Bureau of Aeronautics of the Naval General Staff to supervise the construction of seaplanes at Petrograd for the Baltic Sea Aviation. During this period he made many valuable technical suggestions which were accepted to the benefit of the service.

At his own request, in spite of his artificial limb, he was permitted to return to the front, assumed command of an air squadron in the Baltic Sea, and took part in many air operations and engagements, of which I wish to cite one episode only:

On July 31, 1916, two of our seaplanes undertook a bombing raid on the German Seaplane Station on Angern Lake. After dropping their bombs our planes were attacked by seven enemy planes. The fight lasted for nearly two hours. The machine gun of Seversky's companion had jammed, and Seversky defended him as well as his own plane until both returned to their base. Two enemy planes were forced to land by Seversky and others were put out of action. For this exploit Seversky, on my own recommendation, was awarded the Golden Sword of St. George.

That is why the undersigned considered it a pleasure to give Seversky a formal statement citing his services in 1918, when Seversky left for the United States. I quote from that statement:

"Lieutenant-Commander Alexander Prokofieff Seversky served in the Baltic Sea Naval Aviation under my personal command during the war and showed himself one of the most excellent pilots and officers of this service, indefatigable, brave, and a man of inventive powers."

As you should know, he has more than lived up to this brief summary in his years of service to aviation in the United States. Naturally, General Malone could not know the details. Yet it seems unfair to the readers of your magazine for him to belittle and ignore the brilliant record of a man who has dedicated all those years to aviation. I do hope that in ordinary fairness you will correct the wrong impression left by General Malone's article.

Let me also take exception to General Malone's contempt for "hall strategists," as he calls everyone not officially assigned to this special job. Having been myself a professor of the Nikolaevsky Naval College on the subject of "Naval Organization," I am naturally the last one to belittle the value of military science. Still, one has to accept the fact that many sound ideas in strategy and tactics have been developed by civilians without any military experience. Take, for example, that Scottish gentleman, Mr. Clerk of Eldin, who in the middle of the Eighteenth Century, through a series of speculations and calculations, created the naval tactics with which Sir Rodney won against the French Navy. If England had taken more seriously the ideas of her most imaginative writer, H. G. Wells, and become, right after the World War I, a real Queen of Air, the current history of the World might be quite different.

In the art of war common sense, combined with a vivid imagination, is even more valuable than a mere textbook education; when supplemented with experience, it provides real leadership. Seversky's book, and his personal record, certainly cannot be ignored because he has no "official" authority.

I do not share the apprehension of General Malone that "Victory Through Air Power" may be harmful to the morale of our boys in service. No books or speeches can uphold or disrupt that morale. Give them what they need—the best equipment we can procure—and they will win the war. As one of our aces was quoted recently, the morale of the men at the fighting front would go up 100% if they had the best planes. That is the point.

Sincerely yours,

B. DOUDOROFF

[PAGE 8] *From a letter to Skyways magazine, written by Captain A. A. Toochkoff, former Chief of the Naval Aviation Department of the Russian Naval General Staff, de Seversky's direct superior during World War I, in reply to the same article. November 23, 1942.*

Dear Sir:

The . . . article by General Malone, entitled "Victory Through Air Prophets?" . . . attacks not only Major Seversky's views, but also Major Seversky personally. . . . I feel it my duty to the American people . . . to right this grave injustice by establishing the truth and stopping this unwarranted and sinister attack upon one of the most brilliant careers produced during the last war.

. . . It is true that he lost his leg in his first night bombing raid in July of 1915. But that was not the end of Major Seversky's service in battle, only the beginning. . . . Major Seversky's passionate devotion to flying and to the Allied cause convinced me that he should be restored to active duty. . . . By special act of the Government, he was so restored to combat duty early in 1916.

Even during his convalescence, in the winter of 1915-16, while still on crutches, he was appointed Inspector of Aircraft Production of the Petrograd District for the Russian Navy. During his six months' duty there, he rapidly absorbed knowledge of aircraft design and production and made valuable contributions which enhanced the military characteristics of our battleplanes.

It would take too much space to cite all the exploits and acts of valor performed by Major Seversky in combat during the years 1916 and 1917, but suffice it to say that he became a leading ace of the Naval Air Service. . . . He was made a Commander at the age of 23 and appointed Chief of the entire pursuit Aviation of the Baltic Sea. . . .

In 1917 I was directed to form a Naval Aviation Mission for the United States. . . . I selected the then Commander Seversky as a member of my mission because I felt that his experience in combat, his inventive talents, and the technical contributions that he had already made, would be of great service not only to my mission, but also the American Government. . . .

To dismiss such a man casually . . . is simply ridiculous, or worse, deliberate misrepresentation. . . . Cannot General Malone appreciate and approve the spirit and courage of a young officer who returned to active duty after suffering a severe injury in order to serve his country and who, despite the physical handicap, acquired a brilliant combat record with few parallels in the history of military aviation? Cannot [he] recognize such spirit and courage and achievement. . . .

Sincerely yours,

A. A. TOOCHKOFF

[PAGE 10] *Letter from Major General Andrews:*

HEADQUARTERS PANAMA CANAL AIR FORCE  
OFFICE OF THE AIR FORCE COMMANDER

December 21, 1940

My dear Seversky:

. . . I learned from the paper today that you have been presented the Clifford Burke Harmon trophy, as being the world's outstanding airman of 1939. Congratulations. I wish we had more people in the country with the imagination and vision in air matters that you have.

Sincerely,  
F. M. ANDREWS,  
Major General, U. S. Army.



[PAGE 204] *Letter from General Spaatz:*

HEADQUARTERS  
UNITED STATES STRATEGIC AIR FORCES IN EUROPE  
OFFICE OF THE COMMANDING GENERAL

29 June 1945

Dear Sasha [de Seversky]:

My attention has been called to your articles in the New York Times of 18 and 21 February 1944. I have read what you have stated very carefully and feel that you have sensed in an extraordinary manner the basic ideas which were involved in the utilization of our air power at that time.

It goes without saying that the primary task is to secure control of the air. This does not necessarily mean air supremacy or even air superiority. However, it does mean that it gives one the ability to employ his Air Forces as he sees fit and denies that same privilege to the Air Forces of the enemy. This, in the Air War over Europe, meant in concrete terms that it was necessary to destroy the German fighter force. Until that was secured, all other application of armed resources would have been ineffective.

That you from a remote position could sense so thoroughly the essential facts involved in the application of our Air Power against Germany is to say the least remarkable.

Sincerely  
CARL SPAATZ  
General, USA  
Commanding

[PAGE 215] *Letter from General Chennault, to Simon and Schuster, shortly after publication of Victory Through Air Power:*

HEADQUARTERS, CHINA AIR TASK FORCE  
OFFICE OF THE COMMANDING GENERAL

January 18, 1943

Dear Sirs,

. . . Major Seversky is an old friend of mine. I served on a number of Pursuit Boards as tactical expert from 1931 to 1936 and have flight tested several of Seversky's pursuit planes of that period. It was my opinion then, as now, that he is a great designer as well as a fine pilot. He has vision and imagination required to make proper technical preparations for the employment of air forces. This gift of vision and imagination was either denied to or inhibited in most of our leaders who should have been preparing for this present war. It remains to be seen whether the lesson has been learned and whether proper weight will be given to air power now in order to insure early victory and minimum losses. The record to date is not very bright. . . .

Most sincerely yours,  
C. L. CHENNAULT  
Brig. General, A.U.S.  
Commanding.

[PAGE 348] *Paul M. Raigorodsky, Assistant Director of Petroleum Administration for War, in a letter to a mutual friend:*

I know for a fact that at the beginning of World War II, when our military command proposed increasing the production of aviation gasoline to 125,000 barrels per day (with some members of the different commissions thinking that that amount was too high), Major de Seversky came out with a figure of 450,000 barrels as being necessary to win the war with Germany. For your information, our actual production at the end of the war was over 500,000 barrels per day.

[PAGE xvi] *The following partial list of Major de Seversky's inventions to date indicates the extent of his scientific contribution to aeronautics:*

Basic patent for refueling in the air, Pat. No. 1,728,449  
First fully automatic synchronous bombsight, purchased by the United States and British Governments, Pat. No. 2,027,243, Pat. No. 12,027,349 and Pat. No. 2,027,350  
All-metal fighter plane, Pat. No. Des. 109-958  
All-metal combat two-seater training plane, Pat. No. Des. 111,043  
All-metal basic-training plane, Pat. No. Des. 109-959  
Twin-engine high-altitude fighter plane, Pat. No. 2,210,980  
Retractable twin float Super-Clipper aircraft, Pat. No. Des. 112,834  
Monocoque all-metal aircraft wing structure, Pat. No. 2,135,464  
Differential wing trailing edge flap, Pat. No. 2,191,342 and Pat. No. 2,173,273  
Amphibian landing gear for aircraft, Pat. No. 2,021,876 and RE 21,120  
Shock-absorbing and hydraulically retractable landing gear for seaplanes, Pat. No. 1,963,630  
Amphibian aircraft pontoons, Pat. No. 2,023,312  
Automatic seaplane anchoring device, Pat. No. 2,009,356 and RE 20,870  
Lifeboat and range-extending device for aircraft, Pat. No. 2,389,600  
Electrically operating retractable landing gear, Pat. No. 2,180,462  
Skin covering for aircraft structures, Pat. No. 2,165,459  
Universal flexible gun mount for aircraft, Pat. No. 2,230,614  
Streamlined disappearing gun mount for aircraft, Pat. No. 2,214,722  
Improved engine exhaust installation for aircraft, Pat. No. 2,207,242  
Retractable pilot seat, Pat. No. 2,193,449  
Hydrodynamic Basin for seaplane tests, Pat. No. 1,953,045  
Skiis for aircraft, Pat. No. 1,817,901, used by Sir Hubert Wilkins in his Polar expeditions



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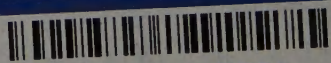
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